Exploring Faculty Use Before and After a Learning Management System Migration: A Survey Approach

A Dissertation submitted
to the Graduate School
Valdosta State University

in partial fulfillment of the requirements
for the degree of

DOCTOR OF EDUCATION

in Curriculum and Instruction

in the Department of Curriculum, Leadership, and Technology
of the Dewar College of Education and Human Services

May 2015

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M.Ed., University of South Carolina-Aiken, 2009
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ABSTRACT

Based on the Technology Acceptance Model (Davis, 1989) and Levels of Use (LoU) of the Innovation (Hall, Loucks, Rutherford, & Newlove, 1975), the purpose of this study was to determine if faculty members' patterns in teaching using various tools within a learning management system (LMS) changed as a result of a major LMS migration. In addition, this study also investigated the challenges faculty members faced and the level of support and training used throughout the migration.

Faculty members, both full-time and adjunct, at two regional universities within the state of Georgia were invited to participate in the study. These faculty members experienced an LMS migration from Blackboard Vista to Desire2Learn during the Summer of 2013. Overall, three research questions were formed addressing LMS tool use and adoption, the overall system usage experience, and the level of training and support used during the migration with certain factors to include: the years of experience using the old and new LMS, types of courses taught, gender, and the number of years having taught in the online and face-to-face environment. To collect data, faculty members had two months to complete a survey instrument that was developed based on both the TAM and LoU frameworks. The data was analyzed using descriptive statistics, *t* tests, ANOVAs, a MANOVA, and inductive analysis coding techniques.

Results indicated that, overall, faculty members adopted most of the tools within the Desire2Learn LMS significantly more compared to the Blackboard Vista LMS except Wimba/Blackboard Collaborate Tool and SCORM Tool. The MANOVA results showed that "faculty status" and "type of course typically taught" might be factors that affected faculty's responses to the level of use for both Blackboard Vista and Desire2Learn. Full-

time faculty members had a significantly higher level of use, moving from the orientation level to the preparation level, compared to adjunct faculty members who remained at the orientation level. In addition, those faculty members who teach face-to-face courses had a significantly lower level of use, starting at the orientation level and remaining at this level, compared to those faculty members who teach online or hybrid courses, who started at the preparation level and moved to the mechanical level of use.

Further, gender and the years of having taught online or hybrid courses did not affect the overall system usage level (how the faculty member learned to use the LMS) during the migration. Lastly, the years of experience using an LMS and years of experience having taught online or hybrid courses did not affect the overall level of training and support (e.g., calling the IT Help Desk, asking a co-worker, attending university training, etc.) a faculty member used during this migration.

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ACKNOWLEDGEMENTS

I would like to thank the several groups of people who contributed to the successful completion of my dissertation research. First, I would like to thank my dissertation committee members, Drs. Steven Downey, E-Ling Hsiao, Daesang Kim, and Travis York. Dr. Downey, my committee chair, for providing the numerous Skype calls and outstanding guidance and support throughout the last year and half. Dr. Hsiao, my researcher, for the countless emails at all times of day and night on the best direction about statistical testing and analysis. Drs. Kim and York for challenging me to continue to improve this research study to be the best it can be. I cannot say thank you enough to the four of you, as this experience would have been a lot more stressful and almost impossible.

I would also like to thank my parents, David and Cindy, and my sister, Amy, for always encouraging and steering me to be the most successful gentleman I can be. Thank-you for giving me the inspiration to become the first generation of a Rucker to graduate college with a bachelor's degree, nerveless a master's and now a doctorate degree. Also, I would like to thank all of my extended family members. Each of you has been great motivation in my life by providing lots of encouragement and support throughout this entire process.

This would not be complete by not only thanking my professors at Valdosta State University (especially within the Department of Curriculum, Instruction, and Technology) but the professors at the University of South Carolina Aiken (especially within the Department of Educational Technology) and the University of South Carolina (especially within the Department of Integrated Information Technology). Earning my doctorate has always been a dream of mine because I want to become a professional educator, like you, and teach future generations about information and instructional technologies. Thank-you to these professors for always critiquing and challenging me to continue to become a life long learner and I hope I will be able to pass this skillset to future generations.

Finally, I would like to thank my close circle of friends—you all know who you are. You all have been my biggest fan club by cheering me along through this process as we have created remarkable memories. I cannot thank-you enough for being there for me through the times I wanted to give up and the complaining I did about how difficult this process seemed. Thanks for also teaching me how to relax and reassuring me that I can and would accomplish this task. I wish you all of the word's success and happiness in the many years to come.

Chapter I

INTRODUCTION

The purpose of this chapter is to introduce the overall rationale of this study. This chapter is divided into eight sections: (1) introduction, (2) background of the study, (3) problem and purpose, (4) research questions, (5) significance and limitations, (6) framework and design, (7) definition of key terms, and (8) summary.

Introduction to Study

Aggarwal and Bento (2002) acknowledges that since the Industrial Revolution the expansion and distribution of information and various technologies has created a powerful influence on the future of education. Due to this shift and expansion in technology, universities and colleges are looking at ways to better integrate instructional technology within the classroom in order to improve student success. One of the leading technologies used to improve student success and engagement within higher education is a learning management system, otherwise known as an LMS (Georgouli, Skalkidis, & Guerreiro, 2008; Kim & Bonk, 2006). Universities and colleges, in all types of disciplines, choose to use an LMS to help deliver classroom instruction in both the traditional and online environments. Spelke (2011) expresses that "LMS are used asynchronously or synchronously in support of online learning, classroom-based learning, and blended or 'hybridized' learning which combines face-to-face and online instruction" (p. 3). Parenti (2012) suggest, "LMS provide the integral foundation for asynchronous and synchronous online learning" in which "course content is not only

disseminated but engaged with in practical, collaborative and constructive ways" (p. 7). Regardless of how the LMS is used within the traditional or online classroom, the university or college must select an appropriate LMS that will be accepted and adopted by faculty members and students.

In most universities and colleges today, a system-wide LMS is already running and being used by faculty, staff, and students. These systems "represent an investment of several hundred thousand to several million dollars, require significant staffing resources, and potentially affect most, if not all of faculty and students at an institution" (Spelke, 2011, p. 3). As technology is constantly improving and rapidly changing, the enhancements, features, and tools within the LMS are being improved for faculty members and students. Much like with any technology system, (e.g., Microsoft Windows) when the newest version of the system is released the user has to purchase the upgrade in order to receive the improved version. Often the same is true with an LMS; when a new version is available the university or college has to purchase the upgrade. Since university administrators and policy makers see an LMS as "an integral part of teaching and learning in higher education" (Eynon, 2008, p. 16) and due to demanding budgetary concerns, these administrators and policy makers will sometimes decide to migrate or change to a completely new LMS outside of the one that is currently being used (e.g., Blackboard to Desire2Learn). While these administrators and policy makers believe that it may be in the best interest of the university or college to migrate to a new LMS, they must select an LMS that meets faculty members' and students' satisfaction, along with having a firm understanding of the benefits and limitations of the LMS and why a faculty member adopts and accepts using the LMS in teaching.

Background of the Study

Over the past decade, "the interest in using the Internet and World Wide Web in the classroom as part of the learning environment has increased drastically" (Saadé & Bahli, 2005, p. 317). Eynon (2008) supports this statement by suggesting that while faculty members are still highly effective in the traditional face-to-face environments, they are seeking innovative ways to provide students with a greater variety of learning course objectives and material. The best method that faculty members find helpful in producing this variety of helping students learn the curriculum is integrating an LMS within the classroom. According to Georgouli et al. (2008), faculty members who use an LMS "can improve quality of the learning experience, increase the availability and accessibility of learning materials, support collaborative activities and strengthen the feeling of belonging to an academic community" (p. 229).

As "educational institutions invest substantial resources in e-learning systems, the benefits of such systems will not be realized if learners fail to use the system" (Pituch & Lee, 2006, p. 222). Davis, Bagozzi, and Warshaw (1989) stress the importance to understanding why end-users accept or reject technology is considered the biggest issue within the information technology field. Further, Venkatesth (2000) states "understanding user acceptance, adoption and usage of new systems is a high priority item for researchers and practitioners alike" (p. 343). Since Pituch and Lee (2006) indicate that a university or college will invest money, time, and training into encouraging faculty members to use an LMS within the classroom; it is very important to determine why a faculty member adopts the LMS and if by using an LMS has changed the faculty member's patterns in teaching (i.e., LMS tool use).

Problem and Purpose

This section is divided into two sub-sections: (1) problem and (2) purpose.

Problem

Instructional technology is not a new phenomenon but one that is constantly changing and revolving in the postsecondary educational setting. Often universities or colleges require faculty members to change from using one type of instructional technology or system to support student learning to a new technology or system, usually within one or two semesters. Since the LMS has been used for over twenty years, universities and colleges must decide when and how to migrate or change to a completely new LMS to improve the access of instructional technology used to support student learning (Ryan, Tyoe, Charron, & Park, 2012). Avgeriou, Papasalouros, Retalis, and Skordalakis (2003) suggest as a university implements or migrates to a new LMS, the process has not been an easy task because LMS are "complex systems that incorporate a variety of organizational, administrative, instructional, and technological components" (p. 11).

Researchers in the past decade have begun to study the phenomenon of LMS and faculty use and acceptance of LMS in teaching online, hybrid, and traditional face-to-face courses (Ali-Busaidi, 2009; Black, Beck, Dawson, Jinks, & DiPietro, 2007; Little-Wiles & Naimi, 2011). Other studies, such as in Leslie (2003), investigated which tools within the LMS various faculty members accept and use; this in turn helps to form a picture of some of the common and not so common features of these system. However most of the studies presented in the literature review of Chapter 2 only investigate the LMS that university or college had currently used at the time of the study. Today very few studies

have been conducted to determine faculty members' use of an LMS and the issues these faculty members had experienced after a university or college has migrated or changed to a new LMS.

Purpose

The purpose of this research study was to determine if faculty members' patterns in teaching using various tools within an LMS (e.g., announcements/news, discussions, grades, etc.) changed after a major LMS migration compared as to the previously used LMS. Other areas investigated included: (i) determining what were the challenges faculty members faced during the migration, and (ii) the level of support and training used by these faculty members during the migration. Factors that were expected to influence the study included how many years of experience each faculty member had using an LMS, which tools he or she used in the old system compared to the new system, what types of course (online, face-to-face, and hybrid) he or she typically taught, age range, and what level of training and support these faculty members reported using during the migration.

Research Questions

The problems described in the above section were examined closely using the old LMS, i.e., Blackboard Vista, as compared to the new LMS, i.e., Desire2Learn. Specific research questions investigated in this study were:

(1) To what extent have faculty members changed their patterns in their use of tools (e.g., announcements/news, discussions, grades, etc.) within Desire2Learn compared to Blackboard Vista?

(2) What are the challenges faculty members encountered during the migration from Blackboard Vista to Desire2Learn as influenced by gender and hybrid and online teaching experience?

(3) What level of support and training was used by faculty members during the migration of Blackboard Vista to Desire2Learn?

Significance, Limitations and Assumptions

This section is divided into three sub-sections: (1) significance, (2) limitations and delimitations, and (3) assumptions.

Significance

This study was designed to produce findings that have both academic and practical value in the areas of (1) faculty members' patterns in teaching using technology (2) common issues after a technology system migration (e.g., challenges), and (3) the needs of technical support and training. As stated earlier in this chapter, very few studies have been conducted to determine faculty members' acceptance and patterns in teaching after a major LMS migration. The significance of this study was to determine the patterns in teaching that faculty members implemented after an LMS migration, the level of acceptance and use of the old versus new LMS, the most common themes or issues the faculty members faced during the migration and the needs of technical support and training for a new LMS.

Limitations and Delimitations

Considering the overall purpose of this study, it is necessary to define the research study's scope.

1. As part of this study, faculty members' compared their use of tools within the previous LMS to the new LMS. Some faculty members were new to the university or college or did not use the old LMS; therefore these faculty members were not able to make a comparison. This limitation was recognized and these faculty members' responses were still included in the sample.
2. The names of some tools and features within Blackboard Vista are called different names within Desire2Learn (e.g., in Blackboard Vista discussion boards are called discussions and in Desire2Learn are called discussion messages). In addition, every attempt to clearly label each tool on the survey instrument as it is called within the LMS was made. The classification of the tools and features within Blackboard Vista and Desire2Learn is solely for the purpose of this research study.
3. All of the public universities and colleges within the state of Georgia were asked to participate in the study. These universities had as few as 50 to as large as 2,000 faculty members on staff. While more than two universities were interested in the study, only two universities agreed to provide contact information for all faculty members within a reasonable period of time. Given these factors (geographical location, nature of courses, and the LMS was adopted by the entire university), were taken into consideration when trying to generalize the results of the study.
4. Both universities had to provide contact information (faculty member's name, email address, college, and department). It is assumed that this contact

information was accurate and included all of the full-time and adjunct faculty members as of Fall 2014.

5. The instrument was designed based on comprehensive review of literature and features within Blackboard Vista and Desire2Learn. Both reliability and validity analyses were conducted to assess the quality of the instrument.
6. The results of the survey instrument are based on the data collected by the number of completed surveys over the allotted time period. Faculty members were given an incentive to participate in the study by being eligible for one of two fifty-dollar gift certificates, if they completed the survey. It was the study's desire and intent that the gift certificates would help achieve a higher response rate.
7. The honesty of participants. Participants were encouraged to answer each question as honestly as possible. Contact information was provided on how to get in contact with the researcher had any questions occurred before, during, or after a faculty member completed the survey instrument.
8. Only invited participants (faculty members) were allowed to participate. Qualtrics, the system that was used to administer the survey, sent initial and follow-up emails to those selected faculty members with a secure URL. Those faculty members who have not been entered into the system were not allowed to participate in this research study.
9. The number of participants that will participate in the survey. Every reasonable attempt was made to encourage and seek participation from all faculty members at both universities. Four emails were sent over the span of two months reminding

faculty members about the study. Having a slightly higher error rate of 5.5% could have limited the ability to generalize the findings to larger populations.

Assumptions

The following factors could have potentially influenced the study:

1. Participants understood how to take a survey within Qualtrics, which is the system that housed the survey instrument. Contact information was provided for technical support within the informed consistent page.
2. The survey used the Qualtrics system that was hosted by one of the universities being studied. It was assumed the university or college would have kept the system and subscription active for the duration of the study and data analysis stage.

Framework and Design

This section is divided into two sub-sections: (1) framework and (2) design.

Framework

The framework used to guide this study was based on two models: the technology acceptance model (otherwise known as the TAM) and the levels of use of the innovation (otherwise known as the LoU). The TAM has been used by many research studies to predict end-user acceptance of various information technology systems by determining the user's received ease of use and perceived usefulness of the system (Venkatesh & Davis, 2000). Overall, the TAM suggests that if the user's perceived ease of use and usefulness is high, the user will accept and use the system. For this study, only perceived ease of use was incorporated. In comparison, the LoU has been used by many studies to "account for the individual variation in use of an innovation" (Hall et al., 1975, p. 52).

The LoU recognizes that outside variables can affect a user's acceptance of an innovation but "what actually happens in the individual application of the innovation is open to tremendous variation" (p. 52) and needs to be investigated. The TAM and LoU is further explained in Chapter 2 of this study.

Design

This study used the concepts of quantitative survey design to collect the necessary data for analysis. A survey instrument was developed based on the concepts of the TAM and LoU to evaluate faculty members received ease of use and level of innovation use of the old LMS compared to the new LMS. In order to determine these two areas, faculty members evaluated their use of tools in the old and new LMS, level of support and training used, main challenges faced during the migration, and level of support and training used. Statistical tests (e.g., MANOVA, ANOVA, and paired *t* test, etc.) were performed on the data gathered and results were reported in Chapter 4.

Definition of Key Terms

1. Asynchronous: When communication between the instructor, student, or both does not occur simultaneously (Hall, 2000).
2. Blackboard Vista: A commercial-based learning management system used by many universities today. Within this study, Blackboard Vista was the LMS the university originally used.
3. Desire2Learn: A commercial-based learning management system used by many universities today. Within this study, the university migrated to the Desire2Learn LMS.

4. End-user: The individually or group of people who actual use the particular technology system. For this study, the end-users were faculty members at a university or college.
5. Face-to-face teaching environment: The transfer of instruction by the instructor to the student when the student and faculty member meet at the same place and time. This is the learning environment that is used by many universities and colleges since the beginnings of education (Bennett & Lockyer, 2004).
6. Hybrid teaching environment: A teaching environment in which the instructor uses various instructional or distance technologies to deliver course instruction. This learning environment is different from the face-to-face environment because part of instruction is delivered at a distance or using various technologies but instruction is not all delivered at a distance (Martyn, 2003).
7. Instructional Design: The process of converting the concepts of learning and instruction in a consistent and reliable fashion for instructional materials and activities (Reiser & Dempsey, 2007).
8. Instructional Technology: Often called educational technology. The Association for Educational Communications and Technology defines Instructional Technology as "the theory and practice of design, development, utilization, management, and evaluation of processes and resources for learning" (Seels & Richey, 1994, p. 1).
9. Learning Management System (LMS): A learning management system (LMS) is an online information system that is used to help faculty members better deliver instruction in various learning environments. This database allows for faculty

members to post course materials (e.g., PowerPoint lecture), multiple assignment drop boxes for students to submit course work, threaded discussions, or complete auto-graded assessments. Overall LMS provided a centralized access to instruction, feedback, grading, and student interaction (Black et al., 2007; Kim & Bonk, 2006).

10. Levels of use of the innovation (LoU): A model used to describe a user's change in behavior as he or she experiences a new innovation. This model suggests that a user may experience eight different levels as a new innovation is introduced (Hall et al., 1975).
11. Migration of an LMS: When a university or college decides to change from one LMS to another LMS (Ryan et al., 2012).
12. Online teaching environment: An online teaching environment in which the instructor delivers all of the content using the Internet and distance education. The instructor may deliver this content all asynchronously or synchronously (Martyn, 2003).
13. Perceived ease of use: One of the two significances to end-user acceptance of an information system according to the technology acceptance model. More specifically, "the extent to which a person believes that using the system will be free of effort" (Venkatesh & Davis, 2000, p. 187).
14. Perceived usefulness: One of the two significances to end-user acceptance of an information system according to the technology acceptance model. More specifically, "the extent to which a person believes that using the system will enhance his or her job performance" (Venkatesh & Davis, 2000, p. 187).

15. Synchronous: When communication between the instructor, student, or both does occur simultaneously (Hall, 2000).
16. Technology Acceptance Model (TAM): A model that is used to predict an end-users acceptance of technology or information system based on usage behavior. The goal of TAM is to be able to "explain user behavior across a broad range of end-user computing technologies and user populations, while at the same time being both parsimonious and theoretically justified" (Davis et al., 1989, p. 985).

Summary

Instructional technology is constantly changing and improving to meet the needs of faculty members and students. An LMS is one instructional system that is being used by many colleges and universities today but often college administrators and officials decide to migrate from one LMS to a completely new LMS within a short period of time. When the decision is made to migrate, these administrators and officials must have a firm understanding of why faculty members will adopt and accept the LMS.

Using the TAM and LoU as the framework, this study investigated faculty member's acceptance of various tools with an old LMS compared to a new LMS to determine if their patterns in teaching changed after a major LMS migration. Additional factors explored included the level of training and support used and the common challenges faculty members faced during the migration. To gather all the necessary data for this study, a survey instrument based on the TAM (incorporating perceived ease of use only) and LoU was created and faculty members at two regional universities within the state of Georgia were invited to participate.

This research study is presented in the form of five chapters. The first chapter, which is what is being presented, outlines the introduction to the study by stating the overall purpose, problem, and overview of the methodology. The following chapter presents a detailed review of literature (Chapter 2) and a further expansion of the study's design and methodology (Chapter 3). After all data was gathered, Chapter 4 was created to analyze and report the data, along with providing discussions of findings, recommendations for further research and conclusions in Chapter 5. An appendices section is included to display a copy emails sent to faculty members, the survey instrument, and other necessary documentation that was used throughout the study.

Chapter II

REVIEW OF LITERATURE

The purpose of this chapter is to discuss the theoretical framework for this study. This chapter is divided into six sections: (1) teaching patterns used within distance education courses, (2) common technology acceptance models, (3) what is an LMS, faculty adaption of an LMS and faculty's role played when using an LMS, (4) prior LMS migrations and challenges faced by faculty members when using an LMS, (5) common tools used within an LMS and faculty members adoption of these tools, and (6) summary.

Teaching Patterns Used within Distance Education Courses

With the constant advancement of technology, "online instruction has emerged as an alternative mode of teaching and learning and a substantial supplement to traditional teaching" (Tallent-Runnels, Lan, Cooper, Ahern, Shaw & Liu, 2006, p. 93). Due to this alternative mode, Moore and Kearsley (1996) stated "the nature of teaching and the role of the instructor in distance education differs from the traditional classroom" (p. 125). Since distance education presents an alternative mode in teaching, faculty members have had to modify and change their patterns in teaching to adapt to the concept of online instruction. Skylar (2004) noted that it is important for universities and colleges to identify the types of instructional media and methods to meet the various learning styles and time constraints of students. Once these methods have been identified, faculty members must be willing to accept the methods and change their patterns in teaching.

Distance education allows the faculty member and student to communicate by printed or electronic media, often within an LMS. Harper, Chen, and Yen (2004) suggested faculty members biggest teaching pattern to change within distance education courses is the type and level of interactions that occur. This is due to the fact that "the Internet and distance learning have created a new business and a new teaching pedagogy" (p. 585). Further, Harper et al. (2004) stated using "the World Wide Web to deliver course material, as well as to promote classroom interaction, is based on the potential of technology to provide 24 hour access to information from any computer connected to the Internet" (p. 592-593). Skylar (2004) found the same conclusion as Harper et al. by suggesting that while different methods had been used in the distance education environment to deliver course curriculum and content (i.e., voiceover PowerPoint presentations, digital videos, electronic textbooks) the teaching method (interaction) had changed. As these authors suggested, since the level of interaction had been the biggest change a faculty member made to his or her patterns in teaching, the faculty member had to explore newer tools within the LMS to improve or better interaction. Coldeway (1995) discussed four different approaches to using interaction within distance education courses to include: 1) same time, same place 2) different time, same place, 3) same time, different place, and 4) different time, different place. Redmond (2011) further explained these interactions by defining each interaction and the various tools within an LMS to use:

1. "Same time, Same place – A traditional face-to-face approach where the instructor and learners are in the same geographical location at the same time. However, today some people might consider using synchronous technology tools such as Wimba and Elluminate, or Skype to interact with others at the same time

in the same virtual space. This virtual space replicates many aspects of face-to-face spaces with all participants having access to the same resources, files and synchronous discussion at the same time;

2. Different time, Same place – Participants in the learning and teaching process interact in the same space but at a time they choose; for example, in asynchronous online discussions;

3. Same time, Different place – This could be viewed as individual students working independently but at the same time, not located at the same place. Or today, it might be considered to be parallel to Same time, Same place where students from geographical different places connect synchronously using different mediums, such as video conferencing, phone, Wimba, or Skype;

4. Different time, Different place – Learners and instructors are separated geographically and also by time. Email is an example of this, where the participants choose the time and place of the asynchronous interaction" (p. 1051).

Furthermore, Redmond (2011) and Moore and Kearsley (1996) suggested that faculty members changed their patterns in teaching by adapting to news roles while teaching distance education courses. Often when faculty members "move from a largely teacher directed face-to-face environment to an online environment" (Redmond, 2011, p. 1052) the roles played in the distance education course has to change. This often results in a change in "roles and responsibilities, use of technology, relationships, presence, and a perceived lack of prestige" (p. 1052). These roles are further defined and explained in Chapter 2.3.5: Faculty's role and competencies when using an LMS.

Telg (1999) recommended the last pattern faculty members often change while

teaching distance education course has been to incorporate multiple teaching methods and strategies in their delivery of instruction or interaction. Telg suggested for faculty members to incorporate four strategies when teaching distance education courses. First, professors must teach in chunks. Ultimately, any video or lecture produced for students to watch should be no more than 15 minutes in length without providing a break. Having a break or shorter lecture allows the students to process what they have learned. Second, all ground rules must be established. This should include discussion board etiquette, email and grading response time, how students are going to be graded, etc. Having these rules established and laid out from the first day will help any confusion throughout the semester. Third, provide a strong online component to supplement the course. Professors need to include additional articles, readings, videos, multimedia, or links to provide support to the main course readings and material. Lastly, organize the content because "presenting content at a distance usually takes more time than presenting the same content in a traditional setting" (p. 2). Faculty members need to understand the setup and tools available in the learning management system and how to interact with both the content and student.

Common Technology Acceptance Models

As information technology advances and newer technologies are released, "understanding and creating the conditions under which information systems will be embraced by human organization remains a high-priority research issue" (Venkatesth & Davis, 2000, p. 186). Venkatesth and Davis noted that over the last twenty to thirty years many technology acceptance models have been created and implemented to determine human organization use, acceptance, and adoption of various technologies. Chutter

(2010) agrees with Venkatesh and Davis by suggesting that "user acceptance of technology has been an important field to study for over two decades" (p. 1) and there has many models use to help predict and explain human organization use and acceptance. Two of the most common technology acceptance and adoption models used today, which will serve as the framework in this study, are the technology acceptance model (TAM) and levels of use of an innovation (LoU).

Technology Acceptance Model

One of the theoretical frameworks used to guide this study is based on the technology acceptance model, otherwise known as the TAM. This model, which was created by Davis (1989), is often used to predict technology acceptance and use by educators, especially end-users' acceptance behaviors of various IT software applications. According to Davis et al. (1989), the TAM is created from an "adaptation of the TRA (theory of reasoned action) specially tailored for modeling user acceptance of information systems" (p. 985). Davis et al. describes the model as a framework "used to provide an explanation of the determinants of computer acceptance that is general, capable of explaining user behavior [i.e., use] across a broad range of end-user computing technologies and user populations, while at the same time being both parsimonious and theoretically justified" (p. 985). Researchers view the major strengths of the TAM to include: "specific focus on information system use, its theory base of social psychology, as well as the validity and reliability of it instruments" (Elwood, Changchit, & Cutshull, 2006, p. 339). Ultimately, the TAM has two particular beliefs, perceived usefulness and perceived ease of use as being the primary significance of end-users acceptance of technology (see Figure 1).

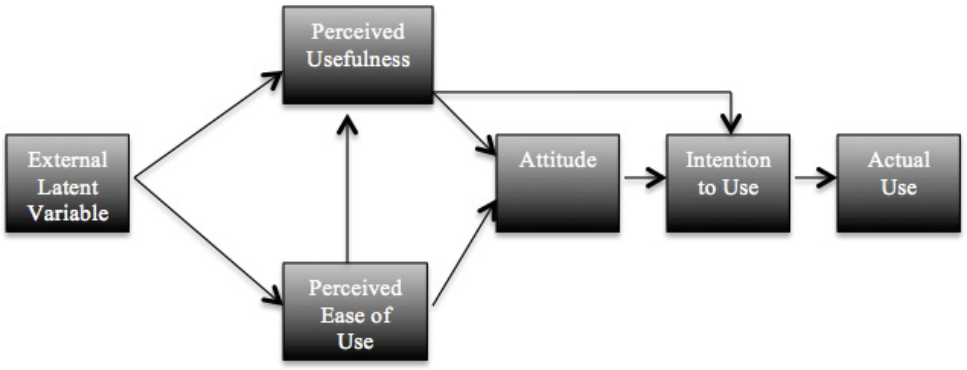

Figure 1. The Original Technology Acceptance Model. Adapted from "User acceptance of computer technology: A comparison of two theoretical models," by F. Davis, R. Bagozzi, and P. Warshaw, *Management Science, 55,* p. 985.

Today researchers often use this model because it receives strong theoretical and empirical support in literature to "describe the issue of how users accept and use a specific technology, as a function of the causal relationships between systems design, features, perceived usefulness, perceived ease of use, attitude toward using, and use" (Padilla-Meléndez, Aguila-Obra & Garrido-Moreno, 2012, p. 307). Venkatesh and Davis (2000) state the "TAM is a well-established, robust, powerful and parsimonious model for predicting use acceptance" (p. 187). Overall, the TAM draws wide spread support and is very successful in predicting about 40% of a system's use (Elwood et al., 2006).

Perceived Ease of Use, Perceived Usefulness, and Attitude

In their study, Park, Lee, and Cheong (2008) defines perceived ease of use within the TAM as "the degree in which the prospective user expects the target system to be free of effort" and perceived usefulness as "the prospective user's subjective probability that using a specific application system will increase his or her job performance within an organization content" (p. 165). Davis et al. (1989) suggests companies and organizations study and look at ways to improve both the perceived ease of use and perceived

usefulness. A company or organization can improve the perceived ease of use by providing better and more efficient training to the end-user and/or improving the interface of the system to be more end-user friendly. Davis et al. (1989) recommends that increasing the quality and/or the quantity of information accessible within the technology system will help improve perceive usefulness.

In the original version of the TAM, attitude is considered another variable affecting the use of the technology and/or system. The TAM defines attitude as the degree in which the end-user has positive (or negative) feelings with the technology or system. Studies suggest that attitude will be correlated to perceive ease of use and usefulness; if the end-user has a greater perceived ease of use and usefulness then the user will have a more positive attitude toward using the technology (Davis et al., 1989).

Modification of TAM

As the TAM advanced and more research was completed using this model, Davis, et al. (1989) determined that perceived usefulness and perceived ease of use is a direct influence on a new variable, behavioral intention. After further testing was conducted, Venkatesh and Davis (1996) removed the variable attitude and replaced it with behavior intention to form the final version of TAM (see Figure 2). Venkatesh and Davis believe as stated by Chutter (2009) removing the attitude variable eliminated any unexplained direct influence observed from the system characteristics to the attitude variable.

In both the old and new version of TAM, external variables play a key component in determining perceived usefulness and perceived ease of use. External variables often include user-training, involvement of the user during the design and development process, and the nature of the implementation process (Venkatesh & Davis, 1996).

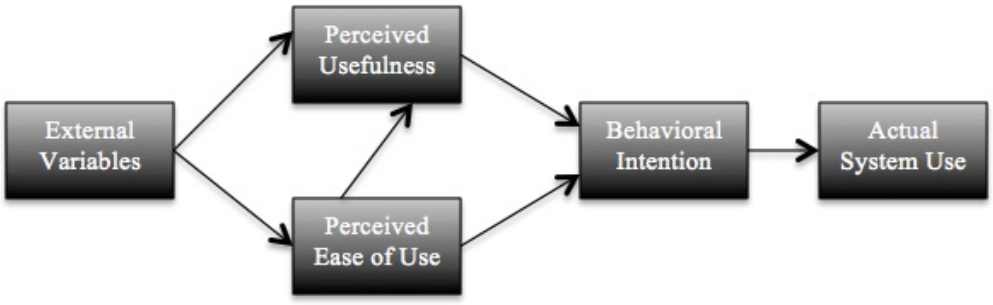

Figure 2. The Final Technology Acceptance Model. Adapted from "A model of the antecedents of perceived ease of use: Development and test," by V. Venkatesh and F. Davis, *Decision Sciences, 27,* p. 453.

Level of Use of the Innovation

A second technology acceptance model used to predict end user acceptance and adoption is the levels of use of an innovation otherwise known as LoU. This model, which was developed by Hall et al. is identified as "a valuable diagnostic tool for planning and facilitating the change process" (p. 53). Hall et al. (1975), states that this model "describes the various stages from spending most efforts in orienting, to managing, and finally to integrating use of the innovation" (p. 52). The developers of LoU suggest that the model is "targeted for describing behaviors of the innovation users and does not at all focus on attitudinal, motivational, or other affective aspect of the user" (p. 52). Rather this model is an "attempt to define operationally various states of innovation user behavior" (p. 52).

The LoU itself is divided into eight levels to include: non-use, orientation, preparation, mechanical use, routines, refinement, integration, and renewal. Users start at the non-use level as they are introduced to the innovation and move through the remaining seven levels as they become more familiar with and adopt the innovation in their daily life. Since all users are unique individuals, a user may not experience all eight

levels because "it must be acknowledged that some individuals will be at less efficient levels" (Hall et al., 1975, p. 56). In comparison to the TAM, which recognizes that certain external variables can play a factor in the perceived use and usefulness of an innovation adoption, the LoU does not consider other variables such as "organizational climate, intervention strategies, and characteristics of decisions makers" (p. 52).

Hall et al. (1975) outlined each level by thoroughly explaining the user's experience. These explanations include: (1) Non-use level: The user has little or no knowledge of the innovation (technology) and is doing nothing toward becoming involved with the innovation; (2) Orientation level: The user has acquired or in the process of acquiring information about the innovation and explored or exploring its value and demands; (3) Preparation: The user has acquired knowledge of the innovation and preparing to use the innovation for the first time; (4) Mechanical: The user has used the innovation and focusing on the short-term, day-to-day use of the innovation often with little time for reflection; (5) Routing: The use of the innovation is stabilized and few changes are being made to improve the innovation use or its consequences; (6) Refinement: The user begins varying the use of the innovation to increase the impact on clients (students); (7) Integration: The user is combining own efforts to use the innovation with related activities of colleagues; and (8) Renewal: The user revaluates the quality of use of the innovation and seeks major modifications to present the innovation to achieve increased impact on clients.

TAM Compared to Other Models

This section is divided into two sub-sections: (1) diffusion of innovation and (2) unified theory of acceptance and use of technology.

Diffusion of Innovation

While the TAM and LoU will be used as the guiding framework, it is important to compare these models to other models that are used in end-user acceptance of technology and systems. A common model that is often used for determining adoption of instructional technology in educational environments is Rogers' diffusion of innovation theory (Medlin, 2001). In his theory, Rogers (2003) points out that diffusion is "the process in which an innovation is communicated through certain channels over time among the members of a social system" (p. 5) while innovation is "an idea, practice, or project that is perceived as new by an individual or other unit of adoption" (p. 12). Yates (2001) makes note that in this theory diffusion is not a single, all-encompassing theory, but it is several theoretical perspectives that relate to the overall concept of diffusion; it is a meta-theory. Overall, Rogers' diffusion of innovation theory is broken into five steps as "an individual is motivated to reduce uncertainty about the advantages and disadvantages of an innovation" (Rogers, 2003, p. 172). These five steps include knowledge, persuasion, decision, implementation, and confirmation. Typically these stages follow each other in a time-order manner. Compared to the TAM, Roger recognizes that external variables can exist such as prior conditions, communication channels, time, and social system. Rather, the diffusion of innovation model suggests that the behavioral intention of use that predicts adoption as in the TAM, "individuals' perceptions of certain

characters predict the rate of adoption of innovation" (p. 219). These characteristics include relative advantage, compatibility, complexity, trialability, and observability.

One point that Rogers' model does suggest that the LoU does not is various adopter categories exist with the adoption of an innovation. During the third stage of Rogers' model, decision, the user determines whether to accept or reject the innovation. However, there are "classifications of members of a social system on the basis of innovativeness" (Rogers, 2003, p. 22). These classifications include innovators, early adopters, early majority, late majority, and laggards. Using these classifications can help "indicate an individual's willingness to change his or her familiar practices" (Braak, 2001, p. 144).

Unified Theory of Acceptance and Use of Technology

As technology acceptance and use has grown and many models have been developed trying to explain technology acceptance and adoption, the unified theory of acceptance and use of technology, otherwise known as UTAUT, is a model created from "reviewing and synthesizing eight theories and models of technology use" (Venkatesh, Thong, & Xu, 2012, p. 157). The UTAUT "serves as a baseline model and applies to the study of a variety of technologies both organizational and non-organizational settings" (p. 158). Furthermore, Venkatesh et al., suggest this model is based on a complex review of literature and adopts constructs and definitions to the consumer technology acceptance and use context. Overall the model incorporates four key predictors of intent to use to include performance expectancy, effort expectancy, social influence, and facilitating conditions (Brown, Dennis, & Venkatesh, 2010). As shown in Figure 3, Venkatesh et al. (2003) believe that four variables will affect the four predictors of intent to include

gender, age, experience, and voluntariness of use.

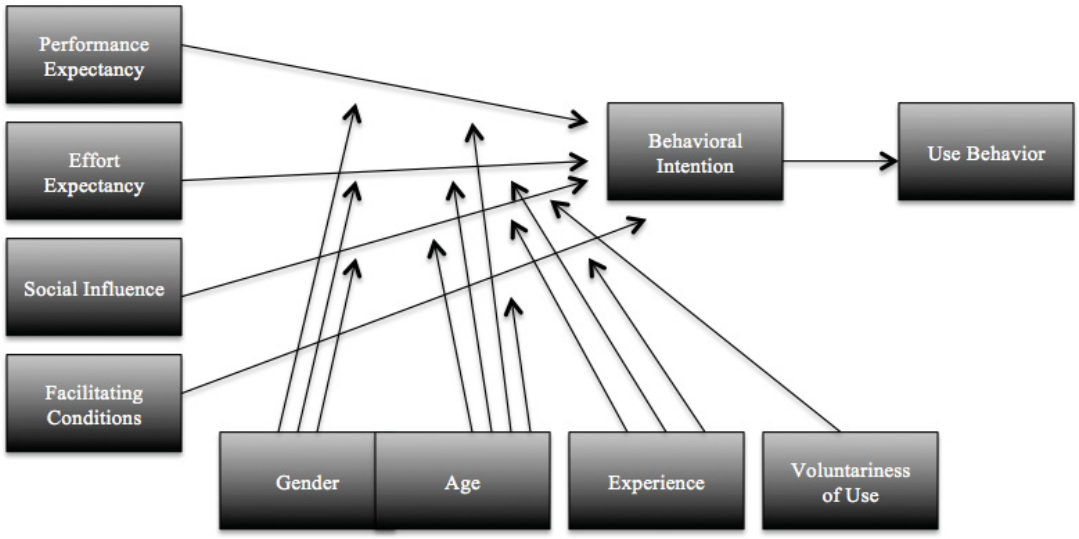

Figure 3. The Unified Theory of Acceptance and Use of Technology. Adapted from "User acceptance of information technology: Toward a unified view," by V. Venkatesh, M. Morris, F. Davis, G. Davis, 2003, *MIS Quarterly, 27,* p. 447.

The UTAUT is developed from the TAM but enhances the TAM by "incorporating social influence and facilitating conditions" (Brown, Dennis, & Venkatesh, 2003, p. 12). In addition, the "UTAUT is based in rich traditions of TAM and provides a foundation for research in technology adoption" (p. 12-13). Ultimately, the UTAUT believes the four predictors of intent will help predict behavioral intention which will lead to use behavior and the adoption of the technology. In comparison to the TAM, the UTAUT "suffers from the limitation of being predictive but not particularly useful in providing explanations that can be used to design interventions that foster adoption" (p. 13).

What is an LMS

Many universities and colleges today are constantly looking at ways to better integrate and implement various instructional technologies, both inside and outside of the

classroom, in hopes of to improving student success and engagement. One of the ways many universities and colleges encourage faculty to integrate technology into their classrooms in order improve success and engagement is by using a learning management system, otherwise known as an LMS (Black et al., 2007). An LMS, sometimes referred to a course management system (CMS) or a virtual learning environment (VLE), is a system which many faculty members adopt across an entire university or college to improve student learning and overall course management (McGill & Klobas, 2009). Ellis (2009) states that an LMS should:

1. Centralize and automate administration of training and learning;
2. Have capability for self-service and self-guided services;
3. Assemble and deliver learning content rapidly;
4. Consolidate training initiatives on a scalable web-based platform;
5. Support portability and standards;
6. Personalize content and enable knowledge re-use. (p. 1)

Alias and Zainuddin (2005) suggests that both faculty members and students can benefit from using an LMS. Faculty members can benefit from using an LMS by "saving time, organization of lecture materials, provision of good and effective ways to evaluate students, and provision of extra resources for lecture" (p. 29). Students can benefit from using an LMS by having "provision of easy access to the subject material, enhancement of the abilities to use technology, increment in interaction between classmates and instructor, and provision of more educational resources" (p. 29). Regardless of the tools, features, enhancements, or other options the LMS has built-in, the LMS must be specifically be designed to support teaching and learning within that particular

university's or college's mission.

In today's market, there are various versions and platforms of LMS that colleges and universities use including Blackboard, Moodle, Desire2Learn, and Learning Studio. Blackboard, Desire2Learn, and Learning Studio are considered to be commercial based systems, meaning the university or college must purchase a license in order to use the system. For universities and colleges not wanting to purchase a license, Moodle is another alternative. Moodle, which is an acronym for modular object-oriented dynamic learning environment, is an open-source LMS that a university or college can download for free from the manufactures' website. Though this is a free download, the university and college must have the appropriate servers and other hardware necessary to run and support the LMS (e.g., servers, routers, switches, etc.).

Importance and Benefits of LMS

In today's college and university educational environments, there is a dramatic shift delivering instruction from the traditional instructor-led classroom to delivering instruction either all online or in a hybrid format. It is estimated that over 6.7 million students completed one online course during the fall 2011 term and nearly 32% of higher education students currently take at least one online course during their college career (Allen & Seaman, 2013). Hybrid or blended format courses are courses in which the instructor uses technology (mostly an LMS) to deliver assignments, assessments, and discussions but is completed in the traditional instructor-led classroom format. Educators often praise hybrid courses because they can use technology to present information and often provide the learner with all the conveniences of online learning (Arispe & Blake, 2012). Allen et al. (2013) estimate that 30-80% of college courses taught today in the

traditional face-to-face environment are considered hybrid because of the use of various technologies and an LMS. Since more and more college students are taking online courses, faculty members have to teach more and more in the online environment. Regardless of the environment in which the course is offered, faculty members must learn, accept, and adapt to using an LMS.

Mullinix and McCurry (2003) states that one of the biggest benefits of an LMS is the ability for faculty members to teach online using a variety of tools and techniques to meet all students' needs. Mullinix and McCurry further expand by suggesting that using an LMS can improve student and instructor communication. Many times faculty members mention that immediately after class or in between classes they have to attend to other work, research or meetings but using an LMS allows them to better connect and respond to students' needs. Another great benefit that faculty members find helpful when using an LMS is the reusing of learning objects. A learning object, defined by Watson, Lee, and Reigeluth (2007) is any digital resource that can be reused for future courses or instruction (e.g., a recorded Adobe Connect lecture). It is very important to understand that it is the reusable nature of the learning object that will make it successful (Watson, et al., 2007). Ultimately using an LMS can have five main benefits that Watson and Watson (2007) suggest:

1. Provide more constructivist-based instruction, focusing on flexible, learner defined goals;
2. Support collaborative learning inside and outside of the school in order to extend the learning environment to the home and further involve parents;

3. Better address personalized assessment, progress tracking, reporting, and responsiveness to learner needs;

4. Truly become systemic, integrating systems seamlessly to allow for improved collaboration across systems and among stakeholders;

5. Improve cost effectiveness and better leverage existing resources currently available in schools and LMSs. (p. 31-32)

Pastae and Ionita (2013) believe that LMS can offer many self-evident characteristics. These researchers point out that though disadvantages exist in an LMS, in most college and university settings the advantages strongly outweigh the disadvantages, especially when "the system is skillfully designed and suited for particular needs" (p. 469). Paste and Ionita (2013) implies some of the major advantages of an LMS:

> The Internet is a widely used means of communication, thus learning takes place in an interactive context. The diversity of scenarios and tasks, as well as the careful monitoring of students' performance, arouse interest and improve motivation. The hypermedia structure of platforms encourages students to learn at their own pace: the informational content can be adapted or reshaped so as to meet particular needs of users. Learning is definitely student-centered and carefully monitored in each particular case. Information is stored in a database and available at any time. Another major advantage of learning management systems is the fact that numerous functions and applications are brought together for the benefit of learners (p. 468)

White and Larusson (2010) also recommend advantages for a university, college, or faculty member to use an LMS. In the study, the authors determine all advantages of using an LMS can be broken into three main characteristics: transmission, evaluation and interaction. Transmission of course materials is very important and is often considered the primary advantage of using an LMS because "these materials are the same lecture notes, slides, or course handouts that instructors would need to distribute to students manually without the aid of an LMS" (p. 3). Georgouli et al., (2008) notices that by providing the faculty member the ability to refine this transmission over time, posting lecture and course material will help support community and motivate the students to read and learn the material. White and Larusson discuss evaluation as a benefit that "provides users with a built-in opportunity to reflect critically on the utility of the LMS to their teaching or learning" (p. 4). In the study, it suggests that often LMS come with pre-configured tools that can help faculty members build rubrics or auto grade various assignments. Lastly, interaction with an LMS can be accomplished in three ways: faculty member to student, student to student, and student to content. Faculty members can use various tools within an LMS (e.g., blog, wiki, discussion, etc.), assuming the LMS has these types of tools automatically installed into the system, to help accomplish all three types of interaction.

Limitations of LMS

Much like any computer system, there are strong advantages but also limitations of using the system. Nayak and Suesaowaluk (2007) suggest that security and cost are two of the biggest limitations within an LMS. Security is a major limitation because the "drawbacks pertain to the quality of learning in an eLearning environment which is

sometimes sacrificed since there is a high security risk in the system" (p. 22-23). These systems must be constantly monitored to make sure no security breaches or hacks occur. Cost is another issue because often the university or college has to buy the dedicated hardware and license and hire additional staff to manage and support the LMS. As Nayak and Suesaowaluk suggest, "moreover startup costs, including hardware, software, staffing, and training, can be very expensive" (p. 22-23).

Wingard (2004) mentions faculty members often have to change their instructional design approach when using an LMS. The faculty members within this study state that having to change their instructional design approach requires more of their time by having to learn the system and how to properly transfer to teaching in a hybrid or online environment. In the study, more than half of faculty members interviewed state that using an LMS allowed them to provide more up-to-date course materials and articles to the student but required a large amount of time preparing these documents. Overall this is one limitation that Wingard suggest of using an LMS is that the "time and effort required to redesign instruction for effective use of web capabilities can slow the process and change" (p. 35) within a course.

Daugherty and Funke (1998) found four barriers faculty members encounter when using an LMS: lack of technical and administrative support, inadequate preparation time for the development of assignments and courseware, inadequate software and technology and inadequate technical knowledge. Many of these faculty members in the study wanted to learn how to integrate an LMS within their course but needed more experience with using the LMS. The researchers believe that since "higher education is evolving, consumer needs are shifting, and competition for students is increasing" (p. 31), faculty

members "who do not use technology are often considered out of date and out of touch with skills that are needed for the coming millennium" (p. 31). In order to accomplish this demand, Daugherty and Funke suggest another limitation of an LMS is that faculty members must have the technology skillset and have access to a wide variety of training and support on using the LMS. In a further study, Woods, Baker, and Hopper (2004) found that faculty members with four or more semesters using an LMS were more likely to use course administration and instructional features within the LMS compared to those faculty members with less experience. In order for faculty members to use the LMS "patience may be to give to faculty members the opportunity to work with the system longer than one or two semester before passing judgment on the LMS" (p. 294). These researchers suggest the same points as Daugherty and Funke stated in which faculty members must be exposed and provided with the best training and support; otherwise faculty members will not adopt the system and will not consider it useful.

Faculty Adoption of LMS

In a study conducted by Little-Wiles and Naimi (2011) results suggest that 68% of faculty members answer they always use an LMS when delivering instruction, 19% some of the time, and 13% little or not at all. Further results conclude that 48% of faculty members use an LMS at least once a week in their courses. Today, in the United States of America, it is estimated that 90% of all universities and colleges adopt an LMS and provide faculty and students access to use this system (Al-Busaidi, 2009). With a large number of faculty members answering favorably to using an LMS and with an LMS on the majority of the United States of America's university and college campuses, common

reasons and factors are needed to determine why faculty members accept and use an LMS in teaching their courses.

One of the biggest reasons why faculty members use an LMS whether teaching online, hybrid or traditional based courses is because faculty members view these systems as "products designed to support them (faculty) with different content area, teaching philosophies and instructional styles" (Black et al., 2007, p. 35). In their study Little-Wiles and Naimi (2011) suggest two common themes why faculty members accept to using an LMS in their teaching to include "ease of use, flexibility, remote access, and versatility" and "student engagement, grades, and communication" (p. 10). Faculty members in this study enjoyed having one central system for posting course documents, assignments, assessments, grades, and other information for students to access compared to separate systems, thus allowing their courses to become more manageable. Also, these faculty members felt as though their courses became more structured and organized for students and themselves to follow and teach. Lastly, these faculty members connote that having a system (LMS) that could be accessed off campus was extremely helpful because they were able to work on grading, posting documents, and responding to student needs while at home on weekends or traveling.

Al-Busaidi (2009) concludes by implying that faculty members' usage and acceptance of an LMS can be determined by four categories: information quality, system quality, computer anxiety, and technology experience. Information quality is referred to as the "perceived output produced by the system" (p. 82). Faculty members must be able to take the information they are trying to present (course objectives, content, etc.) and successfully transfer the knowledge to the learner. Al-Busaidi suggests that if faculty

members do not understand the tools or features within the LMS, most faculty members will stop using the LMS, which leads to the other three categories being investigated. System quality is referred to as the characteristics of the system (e.g., various tools within the system). Al-Busaidi discovered if faculty members are not trained or the university does not provide tutorials on how to use the tools within the LMS, faculty members can become extremely discouraged. Faculty members must be "provided a lot of training to improve their technology experience and lessen their computer anxiety" (p. 88). Computer anxiety, "the fear or apprehension felt by individuals when they use computers" (p. 83), and the overall faculty members' technology experience is considered to be correlated. If a faculty member has positive technology experiences then the faculty member will experience a lower anxiety level in adopting and accepting an LMS, while those faculty members who have negative technology experiences will experience a much higher anxiety level to adopt and accept using LMS in their teaching. Al-Busaidi advises that as a university or college is considering which LMS to use or migrate, it must adopt a system that faculty members will accept. After the LMS is selected, training needs to begin as quickly as possible to help faculty members have a positive technology experience (Al-Busaidi, 2009).

Gautreau (2011) determined that a faculty member's acceptance of an LMS is not correlated to age or gender but to three other demographic factors: tenure status, level of experience with an LMS, and level of experience with computers. In the study, Gautreau's found the tenure status of faculty members to be a strong factor in determining whether faculty members will utilize technology tools, resources, and the LMS. Tenured faculty members will have more experience with teaching and using

various technologies along with having seen technology change within the university or college. Gautreau also recognized similar results as Al-Busaidi (2009), that the level of experience with computers and with technology is closely matched: "if an instructor is adept at using technology as part of their daily life, then those skills transfer to their teaching and technology use is common practice" (p. 11). In addition to the demographic factors mentioned above, Gautreau (2011) identifies seven motivation factors that are related to the adoption of an LMS: (highest to lowest) salary, responsibility, achievement, advancement, company policy/administration, work itself, and recognition. Administration must consider these seven motivational factors when encouraging faculty members to use and accept an LMS. One suggestion, as Gautreau states, is for the university or college to create "a faculty development program with a monetary stipend, reinforce a faculty member's responsibility to teach, and help faculty achieve their goals and advance their knowledge of teaching using an LMS" (p. 12). In having this selective development program, it will allow for faculty members to work closely learning new technology in hopes of having a positive technology experience, reducing computer anxiety, and providing the three top motivational factors (increased salary, responsibility and achievement) to integrate and learn an LMS.

Faculty's Roles and Competencies Using an LMS

Often it is believed that faculty members who use an LMS whether teaching solely online, traditional face-to-face or hybrid classes all have different responsibilities and play different roles depending on which environment he or she teaches in. However, Bennett and Lockyer (2004) conclude that in the online classroom compared to the traditional face-to-face classroom there is no difference in roles played by faculty

members. The study identifies that regardless of the environment the faculty member teaches in, they will have to play the following roles: process facilitator, advisor-counselors, assessor, researcher, content facilitator, technologist, designer, and manager-administrator (Bennett & Lockyer, 2004). In another study Goodyear, Salmon, Spector, Steeples, and Tickner (2001) found the same exact roles to be true as in Bennett and Lockyer's study. However, they went a step further by defining the duties of each role to include

> a process facilitator facilitates the range of online learning activities, an adviser/counselor works privately with each student to help the student achieve the utmost best, a assessor grades assignments and provide constructive feedback, a researcher brings in new knowledge being discovered every day, a facilitator facilitates the learner's growth, a technologist helps make technological choices to help improve the learning environment, a designer designs worthwhile online material that can be used for various sections, and a manager/administrator focuses on issues of security and record keeping. (p. 67)

Yang and Cornelious (2005) determined that all eight roles mentioned by Goodyear et al. (2001) and Bennett Lockyer (2004) are not required but rather only two roles are needed. These two roles consist of a facilitator and instructional designer. As a facilitator the faculty member needs to select and filter information for student consideration, provide thought-provoking questions, and facilitate well-considered discussions (Yang & Cornelious, 2005). Yang and Cornelious warn faculty members that becoming an instructional designer is the harder of two roles due to the fact that this requires more additional training and a larger skillset to acquire. Faculty members must

understand instructional design models (such as ADDIE), instructional design software (such as Adobe Captivate) and how to create student-centered curriculum (Yang & Cornelious, 2005).

Baran, Correia, and Thompson (2011) proposed that while there are many roles for faculty members to play while using an LMS, faculty members must have certain competencies or be willing to learn these competencies before using an LMS. The authors narrowed all competencies into three categories: technology, communication and assessment. Since the LMS are web-based systems and a computer is required, faculty members must understand basic computer operating system, browser navigation, and using software like Microsoft Office. Baran et al. makes it clear that when using an LMS communication is always critical. Each faculty member must understand how to respond quickly and effectively to each student (Baran et al., 2011). Also, Baran et al. notes that evaluating students' learning is very different since these students are in the Net Generation category. Rather than giving test and quizzes, faculty members must assign different types of assignments and assessments depending on the tools built into to LMS to include discussions, blogs, and wikis. The study suggests that distributing different types of assignments will help to ensure that the curriculum is meeting a student-centered curriculum (Baran et al., 2011).

LMS Migrations and Faculty Challenges

According to Ryan et al., (2012) "change is one of the top ten information technology (IT) issues" (p. 222) facing any organization or university. Since the world of educational technology is always involving, improving and changing daily, often universities or colleges have transitioned from one LMS to another in a short period of

time. Ryan et al. (2012) investigated a college that transitioned from Blackboard CE to Blackboard Learn to determine what challenges, issues, or hesitations these faculty members faced. Of the 51 faculty members that responded to the survey, two common themes emerged. The first theme was each faculty member felt as though he or she had little time to revisit or redesign course material(s) before the course was imported into the new LMS. These faculty members stated that some of the course content in the old LMS did not properly transition into the new LMS. Some of the faculty members declared they wished the college's information technology (IT) department had informed them earlier on what types of content would transfer over and what types of content would not transfer over. The second theme was that 63% of faculty members did not make an attempt to attend any of the prior training sessions offered by the college on using the new LMS before going live. Ryan et al. (2012) mentioned the criticalness of reminding faculty members of training sessions and the importance and value of attending these training sessions. However, IT support or the people who provide instructional technology support and/or training, must provide multiple training sessions that occur at different days and times that meet faculty members' schedules. The training and support team must also remember that faculty members have busy schedules with teaching courses, research and other administrative duties. Ryan et al. suggests for future migrations universities or colleges ask faculty members when they are available and plan training sessions around this schedule or train faculty members by department or college in which they work. In conclusion, Ryan et al. makes a strong recommendation for a college or university that plans to make an LMS transition to not focus solely on administrative issues but remember the instructional issues and goals (Ryan et al., 2012).

Ge, Lubin, and Zhang (2010) looked at a university that transitioned from Blackboard to Desire2Learn to determine what faculty members' perspectives of the migration were. The study first constructed three common themes among the six faculty members interviewed. The first theme was the ability for each faculty member to have more control setting up the layout and organization of the course. Many faculty members stated the visual organization of the new LMS allowed for them to better construct the course into an eye-pleasing format and to help better organize course content for both the student and themselves. The second theme that emerged was the options the LMS presented. Faculty members stated that the options within the tools (grade book, discussion board, announcement, etc.) were very limited. Within the new LMS, new tools and options "enabled them to customize the course design, experiment with different instructional techniques, and further extend their creativity" (p. 441). However because the LMS provided more options and some of the tools were named differently in the new LMS compared to the old LMS, the faculty members spent a good amount of time figuring out the new names of the tools and the various options each tool had. The final theme was more faculty members played the role of an instructional designer. Prior to the transition, many faculty members relied on their assigned instructional designer help on making modifications to their course(s) or adding course content. During the migration process, instructional designers were extremely busy testing out the system and learning the system themselves. Many faculty members were asked to transition or bring over their course content from Blackboard to Desire2Learn with some limited help of the instructional designers. In addition, these faculty members received trained using the ADDIE (analysis, design, development, implementation and evaluation) model to

develop and build courses during the migration. Having this "instructional design support, especially in the areas of implementation and evaluation, to be administered simultaneously with technological support at all stages when transiting to a new LMS" (Ge et al., 2010, p. 445) helped make this transition successful.

Benson and Palaskas (2006) found administrative and communication to be the biggest challenges when an LMS is first introduced to faculty members. Administrative challenges include the physical administration of two systems, faculty awareness, and computer plugins. Throughout the migration, faculty members, IT administrators, and other personnel need to use both systems (the old and new LMS) and became confused on when to use each system. Awareness of the new LMS and how to use the system was a serious issue for faculty members and other administrators during the study. Benson and Palaska stress that training was successful if the training had been conducted after the LMS was implemented because faculty members were given the chance to experiment with the LMS and its features in real-time with their own courses they were set to teach or currently teaching. Finally in order to use the new LMS, additional plug-ins or updating of plug-ins (e.g., Adobe Flash) will most likely need to be downloaded and installed. Many faculty members in the study did not download the latest versions of these plug-ins that caused issues accessing the LMS. Two of the biggest communication challenges experienced during the study included IT policies and scheduled meetings. Faculty members suggested that the IT department produce polices of when the LMS would be down for maintenance and the aging of content. Many of the faculty members felt as though the IT department had a lack of response when bugs were reported or when asked about the deletion of content from the LMS. Benson and Palaska recommend that

universities and colleges provide regular scheduled meetings for the entire university community. This will allow faculty members, the IT department, and other university members to discuss the current challenges, issues, and present questions that have not been thought of.

Faculty Adoption of LMS Tools

Within today's LMS, there are multiple tools (e.g., grade book, announcement, discussion board, etc.) present to help faculty members improve student success and engagement, but faculty members must make sure "the tool used in a given course helps the user achieve the desired course goals" (Lonn & Teasley, 2008). Gülbahar and Madran (2009) propose the following features are the most commonly adopted by faculty members:

1. User Management: Administrators can add new users, delete or modify user information and change use rights;
2. Content Creation: Course materials are created and modified using the embedded Web-based editor. This editor also allows file upload to create rich content;
3. Course Management: Instructors can create new courses, delete courses, modify course information and add course content;
4. Customizable Course Environments: Every course is configured as standalone, which enables customizability, for example, activating/deactivating interactive course content, publishing course resources, etc.;
5. Communication and Collaboration Tools Management: Instructors can create

new chat rooms, record and publish chat sessions, and send announcements to learners;

6. Drill and Practice Management: Instructors can design drill and practice tools and easily put them on the course home page. Also, they can give feedback and mark learners' submitted work;
7. Assessment Management: Instructors can make arrangements for partial points for different homework assignments and projects, as well as monitor student progress;
8. System Monitoring and Reporting: Every activity within an LMS, such as chat sessions, messages, forum entries and user logins and logouts are monitored. In addition, administrators can create reports about activities whenever they want (p. 5).

Tool Classification

Regardless of the tool a faculty member decides to adopt, Lonn, Teasley, and Krumm (2011) believe all tools within an LMS can be broken down into one of three categories: learner-content, learner-instructor and learner-learner interaction. Learner-content tools involve the instructor posting materials related to the course content for the student to review offline. This often requires the instructor to use tools such as content sharing, learning module, dropbox, RSS feeds, or syllabus. Learner-instructor tools involve interaction between the instructor and student. LMS tools often associated with learning-instructor interaction include announcements, assignments, grade book, assessments, and iTunesU. Learner-learner tools involve one classmate interacting with another classmate(s) in the same class. LMS tools that are often used to promote

interaction between other classmates include chat, discussion board, wiki, and blog (Lonn et al., 2011). While an LMS provides many types of tools and options within the tools, faculty members must select the tool that best fits the pedagogy of the course and best way to present the content being taught.

Adoption of Various LMS Tools

Lonn and Teasley (2008) and Meloni (2010) found faculty members adopt communications tools the most in their courses. One of the biggest recommendations from these studies concludes that faculty members must establish communication effectively starting on the first day of the course. In order to establish effective and efficient communication in the online classroom, Meloni points out faculty members must use tools like discussion boards, blogs, social-networking sites (i.e. Facebook, Twitter, Instagram), announcements, and email lists. Lonn and Teasle conclude that 67% of faculty members believe posting announcements is very valuable, 30% valuable, and 6% not valuable. The students in the same study state that 51% of these students believe posting announcements is very valuable, 43% valuable, and 6% not valuable. One faculty member stated that using announcements allowed them "to be better prepared, and, by allowing the other students to read the responses in advance, has led to a more effective use of class time for discussion, analysis, and additional activities" (Lonn & Teasley, 2008, p. 693).

Bonnel and Boehm (2011) suggest that in the face-to-face environment, faculty members return student's papers, quizzes, and exams within a week to two weeks. In their study, these authors investigated which tools faculty members' felt were the most beneficial when providing feedback to students within an LMS and if the method of

returning work to students within a week to two weeks is the same as when faculty members use an LMS. Looking at one hundred and twenty participant's responses to a survey that explores faculty background, experiences, and approach to feedback, the results conclude three common themes in all faculty members: using the best available tools, having a system, and creating a feedback-rich environment (Bonnel & Boehm, 2011). The researchers found that faculty members must utilize various tools within the LMS to provide proper and meaningful feedback. Survey results conclude that many faculty members use built-in rubrics within the LMS because using these rubrics allow them to quickly grade student's work. This also allows for students to see how their work will be evaluated before submission (Bonnel & Boehm, 2011). In conclusion, Bonnel and Boehm suggest faculty members use the same grading rubric for all similar assignments (paper, discussion post, etc.). Using the same grading rubric for similar types of assignments (instructor uses the same rubric for all discussion boards in the course) allows for students to better understand the grading criteria and expectations on each assignment.

Petrovia and Kennedy (2005) believe that rather than investigate the tools that faculty members use most often, faculty members need to investigate which tools students use most often. The researchers affirm that faculty members need to understand which tools they (the students) use and why and then faculty members need to integrate these tools within the course (Petrovic & Kennedy, 2005). This study investigates 262 second semester and 263 fourth semester students in a medical course. Results indicate that a strong number of students, both second and fourth semester, prefer to read announcements and course materials rather than contribute to discussions. In the study, it

was noted that second semester students had a strong discussion board use and responses compared to fourth semester students. Another point that the researchers stress is that more international students respond to discussion posts and view past exam scores compared to local students. These researchers encourage all faculty members to find a way for students to send messages to other students or to the instructor when they experience any issues or have questions. Survey results indicated that 48.3% of second-semester students and 54.8% of four-semester students never sent messages to other students or the faculty member when questions occurred (Petrovic & Kennedy, 2005). The researchers conclude by suggesting that faculty members need to find a way for collaboration among students within the LMS because this helps the students to feel more connected to the course and each other (Petrovic & Kennedy, 2005).

Summary

Today there are many models used in education to determine and predict user acceptance of instructional products and systems. Two of the most popular models used in education and corporate environments are the TAM (technology acceptance model) and LoU (levels of use). These models are compared to the UTAUT and diffusion of innovation. These are the preferred models because they not only consider external conditions such as age, experience, gender, etc., but also suggest that before the actual use of the system can be determined perceived use and usefulness must be analyzed. In this review of literature all of the models mentioned above have been compared and analyzed to determine why the TAM and LoU were selected for this study.

While a college or university is thinking about or migrating to another LMS, it is important to investigate several key components. First, the college and university must

understand both the advantages and disadvantages to using an LMS. There have been many studies conducted to determine these common advantages and disadvantages. However the studies presented in this review suggest for the university or college to look at both the advantages and disadvantages and not just one or the other. Second, the college or university must determine why a faculty member adopts an LMS within in their classroom. Studies suggest that some faculty members adopt an LMS because of incentives provided by the university or college, personal gain, or to expand their own research interests. Third, the university or college must understand the various roles and competencies faculty members will need to be successful at using an LMS. After determining these roles and competences, the university or college must provide faculty members with the best training and support to using the LMS. Studies suggest explaining to faculty members that often they will have to understand instructional design and the creation of online curriculum and content; studies presented in this review imply that has been the hardest skill for many faculty members to understand.

Chapter III

RESEARCH DESIGN AND METHODOLOGY

The purpose of this chapter is to define and explain in detail the research design, methodology, and data analysis that will be used throughout the study. This chapter is divided into six sections: (1) problem and purpose, (2) research questions and hypotheses, (3) design and population, (4) survey instrument, (5) procedures and variables, and (6) data analysis.

Problem and Purpose

This section is divided into two sub-sections: (1) problem and (2) purpose.

Problem

As instructional technology advances and is constantly improving, the need to investigate faculty members' acceptance and use of these technologies is critical. Many colleges and universities today have an LMS already in place but due to certain reasons (e.g., administrative, budgetary, etc.) decide to migrate or change to a completely new LMS. As presented in Chapter 2 of this study, very few studies investigate faculty members' acceptance and use after a major LMS migration and the effect the new LMS has on their teaching patterns.

Purpose

The purpose of this study was to investigate two universities within Georgia that migrated from Blackboard to Desire2Learn during Summer 2013 to determine if faculty members' patterns in teaching using various tools within the LMS are different as

compared to the previous LMS. In addition, the study investigated the challenges faced and the level of support and training that faculty members used during the migration. Factors that were considered throughout the study included years of experience using the old and new LMS, tool use, types of courses taught, age range, level of support and training used.

Research Questions and Null Hypotheses

This section is divided into two sub-sections: (1) research questions and (2) null hypotheses.

Research Questions

The research questions investigated in this study included:

1. To what extent have faculty members changed their patterns in their use of tools (e.g., announcements/news, discussions, grades, etc.) within Desire2Learn compared to Blackboard Vista?
2. What are the challenges faculty members encountered during the migration from Blackboard Vista to Desire2Learn as influenced by gender and hybrid and online teaching experience?
3. What level of support and training was used by faculty members during the migration of Blackboard Vista to Desire2Learn?

Null Hypotheses

The following are the primary null hypotheses used for this study:

1.1 There are no significant differences in faculty members' patterns in their use of tools within Blackboard Vista compared to Desire2Learn.

1.2 There are no significant difference in faculty members' patterns in teaching between the types of courses the faculty member usually teaches and their faculty status while using tools within Blackboard Vista compared to Desire2Learn.

2.1 There are no significant differences in faculty members' experience during the migration from Blackboard Vista to Desire2Learn based on the years having taught online or hybrid based courses and gender.

3.1 There are no significant differences in faculty members' use of various training and support options based on the years of experience using an LMS and the years having taught online or hybrid courses.

Design, Population, and Sample

This section is divided into two sub-sections: (1) design and (2) population.

Design

This research study utilized a survey design to answer the three main research questions. According to Creswell (2009), "survey research provides descriptions of trends, attitudes, or opinions of a population by studying a sample of that population" (p. 12). Fowler (2009) expands and states the overall purpose of survey research "is to produce statistics, that is, quantitative or numerical descriptions about some aspects of the study population" (p. 1). Furthermore, Pinsonneault and Kraemer (1993) suggest that survey research has three defined and distinct characteristics. These characteristics include quantitative descriptions of some aspects of the study population, the main way of collecting information by asking the sample structured and predefined questions, and the best way to collect information from a fraction of the study's population. As

Creswell (2009), Fowler (2009), Pinsonneault and Kraemer (1993) stated in their definition of survey research, the best way to collect data within this study's design is to ask the given sample of the population questions in which their answers will require the data to be analyzed. To accomplish this with the study, a survey instrument using the technology acceptance model (TAM) and the levels of use (LoU) as the underlying frameworks was created.

Given that the overall purpose of this study has been to determine certain characteristics of faculty members (e.g., changes in the patterns of teaching), Check and Schutt (2012) offers that survey research often is the only means available for developing a "representative picture of the attitudes and characteristics of a large population" (p. 160) while "collecting data from many people at relatively low cost" (p. 160). Compared to qualitative research in which the "research is subjective" and "points to the role of human subjectivity in the process of research" (Allen, Titsworth, & Hunt, 2009, p. 4), Rea and Parker (2005) believe that if the survey is implemented properly, it will offer an opportunity to "reveal the characteristics of institutions and communities by studying individuals and other components of those communities that represent these entities in a relatively unbiased and scientific rigorous manner" (p. 7). Having a purely survey-based approach allowed the results to be analyzed and reported with minimum bias. Since the sample in this study included multiple colleges within a university, McIntye (1999) recommends that when research questions need a large sample of the population, survey research has been the best method, along with fact that surveys can "elicit information about attitudes that are otherwise difficult to measure using observational techniques" (p. 75).

Population

The population for this study consisted of faculty members, both full-time and adjunct, within two public universities that belong to the University System of Georgia (USG). Both of these universities used the same previous LMS (Blackboard Vista) and experienced the same migration to Desire2Learn at the same time. In addition, one university was located in the southern part of Georgia and the other in the southwest.

At the time of the study, the university in the southern part of Georgia served approximately 10,000 undergraduate students and 2,200 postgraduate students. This university was classified according to the Carnegie Class as being a large 4-year primary residential university. Furthermore, the Carnegie Class ranks this university as being a Master's/L university (a university that have larger master's programs that award at least 200 masters-level degrees). In comparison, the university in the southwest served approximately 8,164 undergraduate and graduate students. This university was classified according to the Carnegie Class as being a medium 4-year primary residential university. In addition, the Carnegie Class also ranks this university as being a Master's/L university.

As stated earlier, the population for this study included all faculty members within all departments/colleges at each university, regardless of rank or status (full-time or adjunct). No additional faculty members at other regional universities or colleges were asked to participate. In the 2012-2013 school year the university in the southern part of Georgia had 619 faculty members (full-time and adjunct) and the university in the southwest had 469 faculty members.

Survey Instrument

To gather the necessary data for this study, a survey design was utilized with an instrument that has both Likert-scale and open-ended questions to collect a small portion of qualitative data. During the months of mid-October through mid-December all faculty members from both universities received an email four times asking for voluntary participation in a doctoral research study investigating the migration of Blackboard Vista to Desire2Learn and the impact the migration had on their teaching. The survey itself was divided into five major sections that included 1) demographic information, 2) LMS Tool's Level of Use, 3) Experience Using Desire2Learn, 4) Learning How to Use Desire2Learn, and 5) open-ended questions. When writing the survey instrument for this study, several prior research studies that used the TAM and LoU to form possible questions on the instrument were analyzed. Most of the questions that are on the instrument are similar to those of the prior research studies but with modifications to fit the context of an LMS migration and the environment of the universities being studied. Each of above sections, except for the demographic information, was derived from either the TAM (only to include perceived ease of use) or LoU. How each section was specifically derived from each framework is explained further in the following sections below.

Section 1: Demographics: Demographic information on the survey asked each faculty member what is their sex, birth year, faculty status (full-time or adjust), types of courses typically taught, years of experience having taught face-to-face, online or hybrid courses, and years of experience having used Blackboard Vista and any other LMS. While basic demographic information was asked, participants in the sample were not

asked any question that revealed his or her identity within the actual survey instrument. All participants who completed the survey were entered into a drawing for one of two gift certificates to a local restaurant as an appreciation. Those faculty members who did not want to be entered into the drawing had the opportunity send an email and have his or her name removed.

Section 2: LMS Tool's Level of Use: According to TAM, perceived usefulness is the degree in which an end-user believes that the technology (in this study the LMS) will enhance learning (Davis, 1989). Research studies have determined that if faculty members use tools within an LMS (e.g., discussion boards, assessments, assignments), they will have an overall increase in student's final averages. The second section of the survey instrument, LMS Tool's Level of Use, asked faculty members to rate how often he or she had used certain tools within the Blackboard Vista system compared to the tools he or she currently uses within the Desire2Learn system. Faculty members evaluated their use of various tools using the LoU framework. The tools faculty members evaluated included: grade book, announcements/news, discussions, groups, assessments, selective release, message, SCORM modules, virtual classroom, and learning modules. As stated in Chapter 2, the LoU is based on seven unique levels users experience as they are introduced and learn a new innovation (LMS tools). Faculty members had to select their use of each tool using one of the following seven levels: 1) non-use (little to no knowledge of tool), 2) orientation (seeking information about tool), 3) preparation (developing a plan to start using tool), 4) mechanical (use the tool rarely), 5) routine (use the tool frequently with no changes in class structure), 6) integration (always use tool and suggest tool to others), 7) renewal (seeking a more effective alternative to the tool).

Finally, this section of the survey concluded by asking an open-ended question to determine if the faculty member had changed their method in teaching. The intent of this section on the survey was to determine if faculty members had changed their style of teaching by having newer or updated tools presented to them.

Section 3: Experience Using Desire2Learn: David (1989) suggests that the higher the level of perceived ease of use and perceived usefulness, the more likely the user will adopt and frequently use the technology. Having faculty members evaluate their experience with the system and technical problems they encounter will help indicate if the results of section three were valid and reliable. Venkatesth and Davis (1996) suggested that a user's experience when using an innovation for the first few times will help determine a user's attitude toward adopting the innovation. Further, Venkatesth and Davis suggested that if a user had a positive experience using the innovation (less issues), the user was more likely to accept and use the innovation. Therefore, the questions in section 3 investigated and evaluated faculty's experience with the system before and after the migration to Desire2Learn, including the possible challenges and technical problems. Questions in this section asked faculty members to indicate how often they have experienced the following types of issues while using Desire2Learn since going live: browser issues, plug-ins missing or needing to be installed, slowness of the system, course content transferring over with correct course content, harder to navigating or use, timeout length, and the overall preparedness for the migration. To evaluate the responses the survey used a Likert-Scale of 1-5, with 1 being strongly disagree, 2 somewhat disagree, 3 neither agree nor disagree, 4 agree, and 5 strongly agree. Section 3 of the survey closed with an open-ended question asking for faculty members to list and

describe any other challenges or issues experienced during the migration process from Blackboard Vista to Desire2Learn.

Section 4: Learning How to Use Desire2Learn: TAM defines perceived ease of use as the degree in which an end-user believes that technology would be easy to use (Davis, 1989). In the modified version of the TAM (see Figure 2.2), external variables help predict the level of perceived ease of use and usefulness. Venkatesth and Davis (1996) suggested that user training and participation in training is a strong indication of users perceived ease of use. Venkatesh and Davis proposed that the level of training used should be measured when an innovation is first introduced. Therefore, the fourth section of the survey attempted to determine the level of perceived ease of use by investigating faculty members use of the various training and support options based on the years of experience using an LMS and the years having taught online or hybrid courses. To answer this question, the survey included areas that asked faculty members to rate the level of support and training that was provided and used by them during this migration. Specific questions on the instrument included asking faculty members did they watch e-learning tutorials, attended training workshops provided by the university, called university technical support, asked for the assistance of a co-worker, used the Internet, or used other resources. Using a frequency scale of never, rarely, sometimes, often, and always faculty members determined their response to each item. Section 4 concluded with an open-ended question asking for the faculty member to list any other strategies used to overcome the difficulties of using Desire2Learn.

Section 5: Open-End Questions: The final section of the survey instrument asked a series of open-ended questions that included asking the faculty member what

enhancements within Desire2Learn they are using to better deliver instruction in their online, hybrid, and traditional face-to-face courses and what recommendations should be made for future LMS migrations. In this study, some qualitative data was gathered by using an open-ended section of questions. Lastly, faculty members were allowed to provide any additional comments, suggestions, or issues with the survey and migration to Desire2Learn.

Reliability

Reliability in this survey was assessed using the concept of alternate-form. Alternate-form reliability is commonly tested within instruments by rewording items to produce two items that are similar but not identical (Kelley, 1999). Kelley states that using alternate form will "help solve the practice effort problem because when the ordering is different, people have difficulty remembering if the instrument is the same or has been changed" (p. 130). This instrument asked questions in which the participant has to use a Likert-scale to evaluate criteria and asked the same criteria in the form of open-ended responses. According to Engel and Schutt (2010) if the two forms of the questions are administered to participants and the "two sets of responses are not too different then alternate-form reliability is established" (p. 68).

Face Validity

Since validity is considered an important characteristic of any instrument, the survey attempted to establish a high level of validity by using the concepts of face and construct validity. Burton and Mazerolle (2011) suggest face validity be used to determine an "evaluation of the instrument's appearance by a group or experts and/or potential participants" (p. 29). In this study, face validity was accomplished by sending

the survey to three professionals for review to determine if "the suitability of the content of the instrument is for an indented purpose as perceived by participants" (Secolsky, 1987, p. 82). These three professionals were faculty members at another public university or college outside of the one being studied. While these faculty members were not experts in LMS migrations, they had expertise in conducting research and survey instrument creation and implementation. Any recommendations by these faculty members were considered.

Construct Validity

Construct validity according, to Field (2009), "covers the full range of the construct being studied" (p. 12). The overall purpose of construct validity is to "establish an instrument's creditability, accuracy, relevance, and breadth of knowledge regarding the domain" (Burton & Mazerolle, 2011, p. 28). In this study, construct validity was established by having three professionals skilled in the area of instructional technology and LMS migrations to evaluate the content of the instrument being used in its relation to TAM and elements the TAM represents. These three professionals who reviewed the survey instrument worked at a public university or college and were required to have experience in survey instrument creation and delivery. Any recommendations that were suggested by these professionals was integrated into the final version of the survey instrument.

Internal and External Validity

Both internal and external validity were considered throughout the study. The expected internal validity issues were instrumentation effects, human error, selection, and mortality. To help minimize instrumentation effects, the survey instrument was

thoroughly tested with different browsers on different operating systems prior to inviting participants. Having clear instructions on how to complete the survey instrument and contact information on who to contact if issues occur minimized human error. Having required questions with error messages alerting the participant to answer all questions, and by using Qualtrics (system for hosting the instrument), participants were not able to complete the survey more than once, thus eliminating multiple survey responses by the same participant. As with any survey-based study, mortality was a common issue. To minimize mortality so that a higher response rate could have been achieved, four email reminders were sent to participants who have not completed the survey throughout the months of mid October through mid December. Also, two gift certificates were used to encourage faculty members to participate in the study.

Creswell (2009) stated external validity "arises when experimenters draw incorrect inferences from the sample data to persons, other settings, and past or future situations" (p. 162). With many studies, generalizability of the reported results is a major concern and was a concern during the study because the plan was to use convenience samples due to the limited resources. Schutt (2011) states once the researcher has "defined clearly the population from which they will sample, the need to determine the scope of the generalizations" is critical. Generalizability is often defined as the extension of research findings and conclusions from a study conducted on a sample to the population at large (Polit & Hungler, 1991, p. 645). Although "generalizability" probably will be a concern to this study, it does not mean this study is not valuable. The value of this study has been to share faculty perceptions of a system migration in a certain situation and provide possible solutions to prevent problems. In this study, the

convenience samples referred to faculty members from the two regional universities within the state of Georgia that migrated from Blackboard Vista to Desire2Learn at the same time. The results of this study are internally generalizable to other University System of Georgia (USG) institutions as these institutions experienced the same transition from Blackboard Vista to Desire2Learn; however, the results may not be generalizable to other institutions outside of USG. Another threat often associated with external validity, according to Creswell, is the timing of the experiment. For this study, it allowed for one complete academic year to pass to permit faculty members to use the new LMS before deploying the instrument. This helped ensure that faculty members had experience with the new LMS and provide a better comparison on using the old LMS versus the new LMS.

Procedures and Variables

This section is divided into two sub-sections: (1) procedures and (2) variables.

Procedures

In order to obtain participants for this study, a letter of interest (Appendix A) was submitted to a distance education listserv. This listserv was for all LMS administrators throughout all public universities and colleges within the state of Georgia. Based on the responses received, two universities agreed to participate and provide the necessary data (faculty names, email addresses, college and department affiliation) for this study. Institutional Review Board (IRB) applications were submitted at both participating institutions and received an exempt status. Names of the institutions are not included for confidentiality purposes.

Four emails, during the span of mid October through mid December, was sent to faculty members at these two regional universities asking for voluntary participation in survey-based research about their patterns in teaching after migrating to the new LMS (Desire2Learn) compared to the old LMS (Blackboard Vista). Participants had an average of two weeks to respond to the survey instrument before another email reminder was sent. These reminder emails were only sent to faculty members who did not complete the survey. Finally, to encourage faculty members to participate in the survey instrument, each faculty member who completed the survey had the chance to be entered into a drawing for one of two fifty-dollar gift certificates to a local restaurant. A random table generator was used to select the two winning faculty members.

All participants who completed the survey had to read and complete the terms and conditions. These terms and conditions outlined that this study was for a doctoral student in curriculum and instruction that was conducting a study to determine the technology adoption of the new Desire2Learn LMS compared to the old LMS and the effects it has on their teaching. After the faculty member accepted the terms and conditions, they were granted access to begin the survey.

Variables

According to TAM, there can be very few to many external factors that can influence an end-user's perceived ease of use and usefulness to adopt the technology. As shown in Figure 2.2 (in Chapter 2), the TAM suggests that certain external factors will influence users' perceived usefulness and ease of use. External factors that were expected to influence faculty members perceived usefulness and ease of use within this study included certain demographic information such as gender, age range, years

teaching online, traditional face-to-face and hybrid based courses, faculty status, number of years teaching, and experience with the LMS.

In this study, independent and dependent variables existed for each research hypothesis. For null hypothesis 1.1 no independent variable(s) existed. However, there were two dependent variables to include the rating on two sub-scales in section 2 of the survey (Blackboard using the defined LoU scale and the rating on Desire2Learn using the defined LoU scale). Null hypothesis 1.2 had two independent variables, the types of courses the faculty member typically teaches and faculty status. The dependent variables were the same as null hypothesis 1.1, the rating on two sub-scales in section 2 of the survey (Blackboard using the defined LoU scale and the rating on Desire2Learn using the defined LoU scale).

For null hypothesis 2.1 the gender of the faculty member and their years of experience having taught online or hybrid-based courses were the only independent variables. The survey instrument used a Likert-scale to determine the faculty member's experience using Desire2Learn during the migration. The rating on the subscale in Section 3 of the survey served as the dependent variable.

For null hypothesis 3.1 the years of experience the faculty member had at using an LMS other than Blackboard Vista and Desire2Learn and the years having taught online or hybrid courses served as the independent variables. The rating on this frequency scale in Section 4 of the survey was the dependent variable.

Data Analysis

To analyze the results of the survey, data gathered through the first four sections of survey instrument was exported from Qualtrics into SPSS (statistical package for the

social sciences). To answer the three research questions multiple analyses were performed based on the overall response, institution, college affiliation within the institution, and college affiliation compared to other college institutions. The following paragraphs discusses how the data was analyzed at the institution level for each individual questions.

Research Question 1

To analyze the data for the first research question, "To what extent have faculty members changed their patterns in their use of tools (e.g., announcements/news, discussions, grades, etc.) within Desire2Learn compared to Blackboard Vista?" two hypotheses were formed. The purpose of Null Hypothesis 1.1 was to determine whether there are any significant differences in faculty members' patterns in their use of the tools within Blackboard Vista compared to Desire2Learn. A paired *t* test or dependent-means *t* test was executed on the rating on two subscales located within Section 2 of the survey (see Appendix F). Field suggests that a paired *t* test be used "when there are two conditions and the same participants took part in both conditions" (p. 325). The purpose of Null Hypothesis 1.2 was to investigate whether there was any significant difference in faculty members' patterns in their use of tools between the types of courses the faculty member usually teaches and their faculty status while using tools within Blackboard Vista compared to Desire2Learn. To prove this hypothesis, a two-way factorial multivariate analysis of variance (MANOVA) was constructed. This MANOVA examined two independent variables (types of courses taught and faculty status) on the rating on two subscales located within Section 2 of the survey (see Appendix F). In a study conducted by Seamon (2009), results concluded that 32.4% of part-time faculty

members had taught one online course and 22.2% of full-time faculty members had taught one online course. Given the results of this study that more part-time faculty members teach online, this research study wanted to determine if faculty members reported having increased their use of various LMS tools within Desire2Learn depending on the types of courses taught and their faculty status.

Research Question 2

To answer the second research question, "What are the main challenges faculty members encountered during the migration from Blackboard Vista to Desire2Learn as influenced by gender and hybrid and online teaching experience?" one hypothesis was formed. The purpose of Null Hypothesis 2.1 was to investigate whether there were any significant differences in faculty members experience during the migration from Blackboard Vista to Desire2Learn based on the years having taught online or hybrid based courses and gender. Seamon (2009) found that after "examination of online teaching and course development by gender, females had a consistency higher rate of involvement than males" (p. 21). Given the results of this study, a two-way analysis of variance (ANOVA) was performed to examine two independent variables (types of courses taught and gender) with the faculty members overall rating on their experience using Desire2Learn in Section 3 of the survey.

Research Question 3

To answer the data for the third research question, "What was the level of support and training used by faculty members during the migration of Blackboard Vista to Desire2Learn?" one hypothesis was formed. This study also wanted to determine if the years of experience using an LMS and years having taught online or hybrid courses had

an impact on the level of training and support used by faculty members (Section 4 of the survey, see Appendix F). Tallent-runnels et al. (2006) examined several LMS migrations and found that all instructors need some level of training and support. One factor that determines this level was previous experience with the LMS. A two-way ANOVA was run to examine two independent variables (the years of experience using an LMS and years having taught online or hybrid courses) with the rating on the number of times the faculty member used a specific type of training and support in Section 4 of the survey.

Open-Ended Questions

To analyze all of the open-ended questions, the researcher, along with two independent coders, determined any common themes and patterns that multiple faculty members stated using inductive analysis. Patton (2002) states inductive analysis "involves discovering patterns, themes, and categories in one's data (p. 453). To analyze the qualitative data generated from the survey instrument, a color-coding system was used as presented by Patton. In this system, responses were independently analyzed and similar responses were placed into various categories by colors. According to Patton, the researcher must select a proper coding technique with a color-coding system to sort common statements stated by faculty members. The independent coders were individuals who have been unfamiliar with the study to minimize potential bias.

Inter-rater reliability, which is the "degree in which two or more coders or evaluators give the same rating to an identical observable situation using the same rating scale" (Graham, 2010, p. 3), was considered and addressed before coders are given a data set to analyze. Creswell (2009) suggests that when qualitative analysis is required, each coder must document the procedures they will use when coding the data. One strategy

that is often used in research studies, according to Creswell, is a database for the independent coders to report their analysis. This study required each independent coder to use database software as they are coding the open-ended questions. Using this technique will help "check transcripts to make sure that they do not contain obvious mistake during the transcription" (p. 190) and help resolve any conflicts in coding.

In certain studies both quantitative and qualitative data is merged together; however, since this is mostly a quantitative study to determine if a change in an LMS produced a certain behavior, a quantitative design was chosen. In this study, data analysis was merged through data transformation. Creswell and Clark (2011) indicate that during data transformation, the researcher will gather both qualitative and quantitative data concurrently but independently analyze each type of data. After the data was analyzed, any common trends, patterns, or themes from both sets of data was identified. If any trends, patterns, or themes occur, Creswell and Clark acknowledges that it can be used to identify related meta-inferences to explain why the quantitative strand of data (Likert-scale questions) provided a more generalized understanding of the problem than the qualitative data (open-ended questions).

Summary

The technology acceptance model and levels of use of the innovation model were used to form a multi-section survey instrument in the study. Overall this survey was broken into five sections, to include demographics, LMS tool levels of use, experience using Desire2Learn, learning how to use Desire2Learn, and open-ended questions. The survey was deployed and administrated to full-time and adjunct faculty at two regional universities within the state of Georgia. Results were analyzed using *t* tests, a MANOVA,

ANOVAS, and inductive analysis. The next chapter describes the results for the data collected.

Chapter IV

ANALYSIS OF DATA

This chapter describes the analyses conduced in order to test the null hypotheses driving this study. This chapter is divided into four sections: (1) sample, response rate, and reliability, (2) demographics, (3) descriptive statistics about the variables included in the study are discussed, and (4) summary of analyses and findings.

Sample, Response Rate, and Reliability

As mentioned in Chapter 3, the sample for the study consisted of faculty members, both full-time and adjunct, within two public universities in the state of Georgia. This sample included all faculty members within all departments/colleges at each university, regardless of rank or status (full-time or adjunct). No additional faculty members at other regional universities or colleges were asked to participate.

The survey was deployed to 1,236 faculty members over the span of mid-October through mid-December. From these 1,236 faculty members, 305 responded to the survey, for an overall response rate of 24.7%. A total of 51 entries were removed due to incomplete responses or not completing all of the sections within survey for a useable response rate of 20.55%. This generates an estimated 5.5% error rate.

An overall reliability was tested using Cronbach's alpha. The overall rating indicated an overall acceptable internal consistency, $\alpha = .89$ ($M = 102.36$, $SD = 26.46$) was reported. Cronbach's alpha for Tools within Blackboard Vista (Section 2), Tools within Desire2Learn (Section 2), Experience Using Desire2Learn (Section 3), and

Learning How to Use Desire2Learn (Section 4) subscales was .89, .87, .88, and .63, indicating acceptable internal consistency.

Demographics

As displayed in Table 1, Frequency of Faculty By Gender and Status, more full-time female faculty members completed the survey compared to males. More than twice as many full-time faculty members, both male and female, responded than adjunct faculty members. Furthermore as shown in Table 2, Frequency of Years of Experience by Teaching Delivery Format, more females are teaching hybrid or online courses with less than 1 year to 5 years of experience compared to male faculty with the same years of experience. In comparison, those faculty members, both male and female, that have been teaching face-to-face courses for over 16 years are teaching little to no online/hybrid based courses.

According to the frequencies reported in Table 3, Frequency of Years of Experience by LMS, both male and female faculty members have 1 to 3 years of experience using another LMS compared to Blackboard Vista. However, those faculty members who have over 5 years of experience are using the Blackboard Vista LMS more compared to another LMS. As highlighted in Table 4, Frequency of Faculty by Gender and Types of Courses Taught, more female faculty members are teaching a combination of all hybrid or hybrid/online courses compared to male faculty members.

Table 1

Frequency of Faculty By Gender and Status

Faculty Status	Male	Female
Full-time	82 (32.28%)	113 (44.49%)
Adjunct	18 (07.09%)	41 (16.14%)
Total	100 (39.37%)	154 (60.63%)

Table 2

Frequency of Years of Experience by Teaching Delivery Format

	Face-to-Face		Online/Hybrid	
Teaching Experience	Male (%)	Female (%)	Male (%)	Female (%)
< 1 yr.	2 (00.79)	10 (03.94)	37 (14.57)	55 (21.65)
1-5 yrs.	20 (07.87)	42 (16.54)	40 (15.75)	62 (24.41)
6-10 yrs.	22 (08.66)	30 (11.81)	12 (04.72)	23 (09.06)
11-15 yrs.	16 (06.30)	26 (10.24)	10 (03.94)	11 (04.33)
16-20 yrs.	15 (05.91)	21 (08.27)	1 (00.39)	2 (00.79)
> 20 yrs.	25 (09.84)	25 (09.84)	0 (0)	1 (00.39)
Total	100 (39.37)	154 (60.63)	100 (39.37)	154 (60.63)

Table 3

Frequency of Years of Experience by LMS

	Blackboard		Other LMS	
LMS Experience	Male (%)	Female (%)	Male (%)	Female (%)
< 1 yr.	27 (10.63)	52 (20.47)	55 (21.65)	77 (30.31)
1-3 yrs.	29 (11.42)	45 (17.72)	28 (11.02)	52 (20.47)
4-5 yrs.	18 (07.09)	29 (11.42)	9 (03.54)	14 (05.51)
> 5 yrs.	26 (10.24)	28 (11.02)	8 (03.15)	11 (04.33)
Total	100 (39.37)	154 (60.63)	100 (39.37)	154 (60.63)

Table 4

Frequency of Faculty by Gender and Types of Courses Taught

Types of Courses	Male (%)	Female (%)
All face-to-face	46 (18.11)	49 (19.29)
All hybrid	27 (10.63)	51 (20.08)
F2F/Hybrid	13 (05.12)	21 (08.27)
F2F/Online	6 (02.36)	12 (04.72)
Online/Hybrid	8 (03.15)	21 (08.27)
Total	100 (39.37)	154 (60.63)

Data Analysis

This section is divided into four sub-sections: (1) null hypothesis 1.1, (2) null hypothesis 1.2, (3) null hypothesis 2.1, and (4) null hypothesis 3.1.

Null Hypothesis 1.1

To test Null Hypothesis 1.1 "There are no significant differences in faculty members patterns in their use of tools within Blackboard Vista compared to Desire2Learn," multiple paired *t* tests were conducted. These *t* tests analyzed the overall, institution, and college/school-level to determine if any significant differences were found. Results of the *t* test are described below.

To evaluate the use of each tool within the LMS, the faculty member used the LoU scale to rate how often he or she had used the tool within the Blackboard Vista system compared to the Desire2Learn system. The LoU scale is based on seven unique levels that users experience as they are introduced and learn new technologies (for this study the LMS tools). The first level of the LoU, non-use, indicates that a user has little to no knowledge of the tool compared to the seventh level, renewal, which suggests the user is seeking a more effective alternative to the tool (Hall et al., 1975). Ultimately, the higher the rating on the LoU scale, the more the user has adopted and frequently use the LMS tool. Faculty members used Section 2 of the survey (see Appendix G) to evaluate their level of use with each identified tool.

Announcement/News Tool

The sample's overall change in the level of use between the Blackboard Vista announcement tool as compared to the Desire2Learn news tool indicated there was a statistically significant difference between the Blackboard Vista announcement tool (M =

3.35, *SD* = 2.01) and the Desire2Learn news tool (*M* = 3.76, *SD* = 2.07) level of use, $t(253) = -2.79$, $p < .05$. This indicates that members use the Desire2Learn news tool at higher rates than the Blackboard Vista announcement tool.

Further analysis at the institution level indicated that there was not a statistically significant difference in Institution #1 adoption of the Blackboard Vista announcement tool (*M* = 3.66, *SD* = 1.99) compared to the Desire2Learn news tool (*M* = 3.79, *SD* = 2.06) level of use, $t(153) = -.67$, $p > .05$. In comparison, Institution #2 found a statistically significant difference in the adoption of the Blackboard Vista announcement tool (*M* = 2.87, *SD* = 1.96) compared to the Desire2Learn news tool (*M* = 3.71, *SD* = 2.10) level of use, $t(99) = -3.89$, $p < .05$.

Table 5, Announcement/News Tool Results by Colleges, below highlights the results of the paired *t* test at the college/school level within both institutions. Results from this analysis seems to indicate a statistically significant difference in faculty members adoption of the Blackboard Vista announcement tool compared to the Desire2Learn news tool within the College of Education, Nursing/Health, and Arts (Fine Arts).

Table 5

Announcement/News Tool Overall Results by Colleges

		Blackboard		Desire2Learn		*T* Test
College/School	*N*	*M*	*SD*	*M*	*SD*	
Arts/Science	111	3.55	2.05	3.63	2.10	$t(110) = -.33$, $p = .74$
Education	63	3.37	1.90	4.02	2.02	$t(62) = -3.15$, $p = .00$*
Nursing/Health	21	3.19	1.94	4.29	1.79	$t(20) = -2.18$, $p = .04$*
Business	24	3.67	2.28	3.38	2.08	$t(23) = 0.47$, $p = .65$
Arts (Fine Arts)	26	2.58	1.81	3.73	2.22	$t(25) = -3.11$, $p = .01$*
Academic Centers/Advising	9	2.56	2.01	3.44	2.40	$t(8) = -1.58$, $p = .15$

* $p < .05$

Table 6, Significant Announcements/News Tool Results, below highlights the results of the paired *t* test at only Institution #2. When conducting a paired *t* test at the institution level analyses indicated that only Institution #2 had statistical significant results.

Table 6

Significant Announcement/News Tool Results

		Blackboard		Desire2Learn		*T* Test
Institution	*N*	*M*	*SD*	*M*	*SD*	
Institution #2	100	2.87	1.96	3.71	2.10	$t(99) = -3.90$, $p = .00$*

* $p < .05$

These analyses indicated that overall faculty members adopted the Desire2Learn News tool at a higher average compared to the Blackboard Vista announcement tool. Faculty members overall adopted the Blackboard Vista announcement tool on the lower end of the preparation level on the LoU scale (level 3), but after the migration faculty members adopted the Desire2Learn news tool on the upper end of the same level. Institution #2's faculty members had a higher improvement in the adoption of the Desire2Learn news tool compared to Institution #1. Furthermore, the Colleges of Education and Nursing/Health adopted the Desire2Learn news tool at the mechanical level on the LoU scale (level 4) compared to the remaining colleges using the Desire2Learn news tool at the preparation level. According to the mean value, all of the colleges, with the exception of the College of Business, increased their use of this tool after the LMS migration.

Assessment Tool

The sample's overall change in the level of use between the Blackboard Vista assessment tool as compared to the Desire2Learn assessment tool indicated there was a

statistically significant difference between the Blackboard Vista assessment tool (M = 3.34, SD = 2.16) and the Desire2Learn assessment tool (M = 4.10, SD = 2.03) level of use, $t(253) = -6.73$, $p < .05$. This indicates that faculty members use the Desire2Learn assessment tool at higher rates than the Blackboard Vista assessment tool.

Further analysis at the institution level indicated that there was a statistically significant difference in Institution #1 adoption of the Blackboard Vista assessment tool (M = 3.63, SD = 2.17) compared to the Desire2Learn assessment tool (M = 4.32, SD = 1.90) level of use, $t(153) = -4.63$, $p < .05$. Institution #2 also had a statistically significant difference in the adoption of the Blackboard Vista assessment tool (M = 2.89, SD = 2.08) compared to the Desire2Learn assessment tool (M = 3.76, SD = 2.19) level of use, $t(99) = -5.04$, $p < .05$.

Table 7, Assessment Tool Results by Colleges, below highlights the results of the paired t test at the college/school level within both institutions. Results from this analysis seems to indicate a statistically significant difference in faculty members adoption of the Blackboard Vista assessment tool compared to the Desire2Learn assessment tool within the College of Arts/Sciences, Education, Nursing/Health, and Arts (Fine Arts).

These analyses indicated that overall faculty members adopted the Desire2Learn assessment tool at a higher average compared to the Blackboard Vista assessment tool. Faculty members, overall, adopted the Blackboard Vista assessment tool on the preparation level of the LoU scale (level 3), but after the migration faculty members adopted the Desire2Learn assessment tool at the mechanical level of the LoU scale (level 4). Both institutions had a higher average of adopting the Desire2Learn assessment tool compared to the Blackboard Vista assessment tool. Furthermore, the Colleges of

Arts/Sciences, Education, Nursing/Health, and Academic Centers/Advising adopted the Desire2Learn assessment tool at the mechanical level on the LoU scale (level 4) compared to the remaining colleges using the Desire2Learn assessment tool at the preparation level. According to the mean value, all of the colleges increased their use of this tool after the LMS migration.

Table 7

Assessments Tool Results by Colleges

		Blackboard		Desire2Learn		*T* Test
College/School	*N*	*M*	*SD*	*M*	*SD*	
Arts/Science	111	3.55	2.25	4.12	2.11	$t(110) = -3.16, p = .00$*
Education	63	3.41	1.92	4.24	1.81	$t(62) = -4.12, p = .00$*
Nursing/Health	21	2.57	1.86	4.10	1.95	$t(20) = -3.93, p = .00$*
Business	24	3.17	2.35	3.84	2.08	$t(23) = -1.50, p = .15$
Arts (Fine Arts)	26	3.15	2.29	3.85	2.22	$t(25) = -2.88, p = .01$*
Academic Centers/Advising	9	3.00	2.45	4.33	2.50	$t(8) = -1.84, p = .10$

* $p < .05$

Email Box Tool

The sample's overall change in the level of use between the Blackboard Vista email box tool as compared to the Desire2Learn email box tool indicated that there was a statistically significant difference between the Blackboard Vista email box tool ($M = 3.23$, $SD = 2.15$) and the Desire2Learn email box tool ($M = 4.07$, $SD = 2.08$) level of use, $t(253) = -6.86$, $p < .05$. This indicates that faculty members the use Desire2Learn email box tool at higher rates than the Blackboard Vista email box tool.

Further analysis at the institution level indicated that there was a statistically significant difference in Institution #1 adoption of the Blackboard Vista email box tool ($M = 3.65$, $SD = 2.14$) compared to the Desire2Learn email box tool ($M = 4.42$, $SD =$

1.94) level of use, $t(153) = -5.17$, $p < .05$. Institution #2 also had a statistically significant difference in the adoption of the Blackboard Vista email box tool ($M = 2.58$, $SD = 1.99$) compared to the Desire2Learn email box tool ($M = 3.54$, $SD = 2.18$) level of use, $t(99) = -4.50$, $p < .05$.

Table 8, Email Box Tool Results by Colleges, below highlights the results of the paired *t* test at the college/school level within both institutions. Results from this analysis seems to indicate a statistically significant difference in faculty members adoption of the Blackboard Vista email box tool compared to Desire2Learn assessment tool within the College of Arts/Sciences, Education, and Business.

Table 8

Email Box Tool Results by Colleges

		Blackboard		Desire2Learn		*T* Test
College/School	*N*	*M*	*SD*	*M*	*SD*	
Arts/Science	111	3.21	2.13	3.89	2.08	$t(110) = -3.80$, $p = .00$*
Education	63	3.35	2.10	4.19	1.90	$t(62) = -3.99$, $p = .00$*
Nursing/Health	21	3.71	2.33	4.67	1.62	$t(20) = -1.76$, $p = .09$
Business	24	3.17	2.60	4.42	2.13	$t(23) = -3.05$, $p = .01$*
Arts (Fine Arts)	26	2.92	2.23	3.62	2.64	$t(25) = -1.66$, $p = .11$
Academic Centers/Advising	9	2.56	2.01	4.44	2.24	$t(8) = -2.20$, $p = .06$

* $p < .05$

These analyses indicated that overall faculty members adopted the Desire2Learn email box tool at a higher average compared to the Blackboard Vista email box tool. Faculty members, overall, adopted the Blackboard Vista email box tool on the preparation level of the LoU scale (level 3), but after the migration faculty members adopted the Desire2Learn email box tool at the mechanical level of the LoU scale (level 4). Both institutions had a higher average of adopting the Desire2Learn email tool

compared to the Blackboard Vista email box tool. Furthermore, the College of Nursing and Academic Centers/Advising adopted the email box tool the most in the Desire2Learn and in contrast the Colleges of Arts/Science and Arts (Fine Arts) adopted the email box tool the least. According to the mean value, all of the colleges increased their use of the email box tool after the LMS migration.

Discussions Tool

The sample's overall change in the level of use between Blackboard Vista discussion board tool as compared to the Desire2Learn discussion board tool indicated that there was a statistically significant difference between the Blackboard Vista discussion board tool ($M = 3.31$, $SD = 2.20$) and the Desire2Learn discussion board tool ($M = 4.04$, $SD = 2.04$) level of use, $t(253) = -6.01$, $p < .05$. This indicates that faculty members use the Desire2Learn discussion board tool at higher rates than the Blackboard Vista discussion board box tool.

Further analysis at the institution level indicated that there was a statistically significant difference in Institution #1 adoption of the Blackboard Vista discussion board tool ($M = 3.64$, $SD = 2.27$) compared to the Desire2Learn discussion board tool ($M = 4.06$, $SD = 2.01$) level of use, $t(153) = -2.71$, $p < .05$. In comparison, Institution #2 also found a statistically significant difference in the adoption of the Blackboard Vista discussion board tool ($M = 2.81$, $SD = 2.00$) compared to the Desire2Learn discussion board tool ($M = 3.99$, $SD = 2.11$) level of use, $t(99) = -6.60$, $p < .05$.

Table 9, Discussion Board Tool Results by Colleges, below highlights the results of the paired *t* test at the college/school level within both institutions**.** Results from this analysis seems to indicate a statistically significant difference in faculty members

adoption of the Blackboard Vista discussion tool compared to the Desire2Learn discussion tool within the College of Arts/Sciences, Education, Nursing/Health, Arts (Fine Arts), and Academic Centers/Advising.

Table 9

Discussion Board Tool Results by Colleges

		Blackboard		Desire2Learn		*T* Test
College/School	*N*	*M*	*SD*	*M*	*SD*	
Arts/Science	111	3.25	2.34	3.61	2.12	$t(110) = -2.00, p = .05$
Education	63	3.71	2.05	4.52	1.67	$t(62) = -4.00, p = .00$*
Nursing/Health	21	3.62	2.04	4.86	1.24	$t(20) = -2.77, p = .01$*
Business	24	2.88	1.99	3.83	2.14	$t(23) = -2.01, p = .06$
Arts (Fine Arts)	26	3.15	2.38	4.00	2.50	$t(25) = -2.42, p = .02$*
Academic Centers/Advising	9	2.22	1.64	4.56	2.24	$t(8) = -3.30, p = .01$*

* $p < .05$

These analyses indicated that overall faculty members adopted the Desire2Learn discussion board tool at a higher average compared to the Blackboard Vista discussion board tool. Faculty members, overall, adopted the Blackboard Vista discussion board tool on the preparation level of the LoU scale (level 3), but after the migration faculty members adopted the Desire2Learn discussion board tool at the mechanical level of the LoU scale (level 4). Both institutions had a higher average of adopting the Desire2Learn discussion board tool compared to the Blackboard Vista discussion board tool, with Institution #2 having a much larger difference in means. Furthermore, the College of Nursing adopted the discussion board tool the most in the Desire2Learn while the College of Arts/Sciences adopted the discussion board tool the least. According to the mean value, all of the colleges increased their use of the discussion board tool after the LMS migration.

Grade Book Tool

The sample's overall change in the level of use between the Blackboard Vista grade book tool as compared to the Desire2Learn grade book tool indicated that there was a statistically significant difference between the Blackboard Vista grade book tool (M = 3.85, SD = 2.21) and the Desire2Learn grade book tool (M = 4.78, SD = 1.83) level of use, $t(253) = -7.82$, $p < .05$. This indicates that faculty members use Desire2Learn grade book tool at higher rates than Blackboard Vista grade book tool.

Further analysis at the institution level indicated that there was a statistically significant difference in Institution #1 adoption of the Blackboard Vista grade book tool (M = 4.17, SD = 2.18) compared to the Desire2Learn grade book tool (M = 4.74, SD = 1.86) level of use, $t(153) = -3.94$, $p < .05$. In comparison, Institution #2 also found a statistically significant difference in the adoption of the Blackboard Vista grade book tool (M = 3.36, SD = 2.18) compared to the Desire2Learn grade book tool (M = 4.85, SD = 1.78) level of use, $t(99) = -7.74$, $p < .05$.

Table 10, Grade Book Tool Results by Colleges, below highlights the results of the paired t test at the college/school level within both institutions. Results from this analysis seems to indicate a statistically significant difference in faculty members adoption of the Blackboard Vista grade book tool compared to the Desire2Learn grade book tool within all of the colleges being reported.

These analyses indicated that overall faculty members adopted the Desire2Learn grade book tool at a higher average compared to the Blackboard Vista grade book tool. Faculty members, overall, adopted the Blackboard Vista grade book tool on the preparation level of the LoU scale (level 3), but after the migration faculty members

adopted the Desire2Learn grade book at the mechanical level of the LoU scale (level 4). Both institutions had a higher average of adopting the Desire2Learn grade book tool compared to the Blackboard Vista grade book tool. Furthermore, all of the colleges adopted the Desire2Learn grade book tool either on the mechanical level of the LoU scale (level 4) or on the routine level (level 5) and increased their use of the grade book tool after the LMS migration.

Table 10

Grade Book Tool Results by Colleges

		Blackboard		Desire2Learn		*T* Test
College/School	*N*	*M*	*SD*	*M*	*SD*	
Arts/Science	111	3.89	2.31	4.68	1.94	$t(110) = -4.72$, $p = .00$*
Education	63	4.06	2.07	4.78	1.64	$t(62) = -2.82$, $p = .01$*
Nursing/Health	21	3.71	1.88	5.48	0.60	$t(20) = -4.26$, $p = .00$*
Business	24	3.92	1.91	5.00	1.50	$t(23) = -2.55$, $p = .02$*
Arts (Fine Arts)	26	3.54	2.61	4.46	2.47	$t(25) = -2.74$, $p = .01$*
Academic Centers/Advising	9	2.89	2.32	4.78	2.17	$t(8) = -2.39$, $p = .04$*

* $p < .05$

Groups Tools

The sample's overall change in the level of use between the Blackboard Vista groups tool as compared to the Desire2Learn groups tool indicated that there was a statistically significant difference between the Blackboard Vista groups tool ($M = 2.25$, $SD = 1.80$) and the Desire2Learn groups tool ($M = 2.57$, $SD = 1.90$) level of use, $t(253) = -3.22$, $p < .05$. This indicates that faculty members use the Desire2Learn groups tool at higher rates than the Blackboard Vista groups tool.

Further analysis at the institution level indicated that there was a statistically significant difference in Institution #1 adoption of the Blackboard Vista groups tool ($M = 2.38$, $SD = 1.84$) compared to the Desire2Learn groups tool ($M = 2.66$, $SD = 1.86$) level

of use, $t(153) = -2.29$, $p < .05$. In comparison, Institution #2 also found a statistically significant difference in the adoption of the Blackboard Vista groups tool ($M = 2.06$, $SD = 1.72$) compared to the Desire2Learn groups tool ($M = 2.42$, $SD = 1.95$) level of use, $t(99) = -2.28$, $p < .05$.

Table 11, Groups Tool Results by Colleges, below highlights the results of the paired *t* test at the college/school level within both institutions**.** Results from this analysis seems to indicate a statistically significant difference in faculty members adoption of the Blackboard Vista groups tool compared to the Desire2Learn groups tool within the College of Education and Nursing/Health.

Table 11

Groups Tool Results by Colleges

		Blackboard		Desire2Learn		*T* Test
College/School	*N*	*M*	*SD*	*M*	*SD*	
Arts/Science	111	2.11	1.71	2.20	1.67	$t(110) = -0.59$, $p = .56$
Education	63	2.60	1.78	3.03	1.93	$t(62) = -2.66$, $p = .01$*
Nursing/Health	21	2.14	1.80	2.86	2.08	$t(20) = -2.15$, $p = .04$*
Business	24	1.63	1.31	2.33	1.83	$t(23) = -2.10$, $p = .05$
Arts (Fine Arts)	26	2.69	2.46	2.73	2.24	$t(25) = -0.12$, $p = .91$
Academic Centers/Advising	9	2.22	1.56	3.33	2.35	$t(8) = -1.70$, $p = .13$

* $p < .05$

These analyses indicated that overall faculty members adopted the Desire2Learn groups tool at a higher average compared to the Blackboard Vista groups tool. Faculty members, overall, adopted the Blackboard Vista groups tool on the lower end of the orientation level on the LoU scale (level 2), but after the migration faculty members adopted the Desire2Learn groups tool above the middle of the same level. Both institutions had a higher average of adopting the Desire2Learn groups tool compared to

the Blackboard Vista groups tool. All of the colleges increased their use of the groups tool after the LMS migration, with the Academic Centers/Advising having the highest mean difference. Furthermore, all of the college adopted the Desire2Learn groups tool either on the orientation level of the LoU scale (level 2) or on the preparation level (level 3).

Learning Module Tool

The sample's overall change in the level of use between the Blackboard Vista learning module tool as compared to the Desire2Learn learning module tool indicated that there was a statistically significant difference between the Blackboard Vista learning module tool ($M = 3.31$, $SD = 2.21$) and the Desire2Learn learning module tool ($M = 4.19$, $SD = 2.08$) level of use, $t(253) = -7.11$, $p < .05$. This indicates that faculty members use the Desire2Learn learning module tool at higher rates than the Blackboard Vista learning module tool.

Further analysis at the institution level indicated that there was a statistically significant difference in Institution #1 adoption of the Blackboard Vista learning module tool ($M = 3.47$, $SD = 2.15$) compared to the Desire2Learn learning module tool ($M = 4.29$, $SD = 1.94$) level of use, $t(153) = -5.14$, $p < .05$. In comparison, Institution #2 also found a statistically significant difference in the adoption of the Blackboard Vista learning module ($M = 3.05$, $SD = 2.30$) compared to Desire2Learn learning module tool ($M = 4.03$, $SD = 2.28$) level of use, $t(99) = -4.94$, $p < .05$.

Table 12, Learning Module Tool Results by Colleges, below highlights the results of the paired *t* test at the college/school level within both institutions**.** Results from this analysis seems to indicate a statistically significant difference in faculty members

adoption of the Blackboard Vista learning module tool compared to the Desire2Learn learning module tool within the College of Arts/Science, Education, and Nursing/Health. No other college/department had statistical significant results.

Table 12

Learning Module Tool Results by Colleges

		Blackboard		Desire2Learn		*T* Test
College/School	*N*	*M*	*SD*	*M*	*SD*	
Arts/Science	111	3.49	2.20	4.44	1.99	$t(110) = -5.45$, $p = .00$*
Education	63	3.41	2.18	4.13	2.09	$t(62) = -2.83$, $p = .01$*
Nursing/Health	21	3.05	1.83	4.33	1.96	$t(20) = -3.29$, $p = .00$*
Business	24	2.54	2.32	3.33	2.24	$t(23) = -1.56$, $p = .13$
Arts (Fine Arts)	26	3.00	2.31	3.77	2.25	$t(25) = -1.90$, $p = .07$
Academic Centers/Advising	9	3.89	2.85	4.67	2.12	$t(8) = -0.98$, $p = .36$

* $p < .05$

These analyses indicated that overall faculty members adopted the Desire2Learn learning module tool at a higher average compared to the Blackboard Vista learning module tool. Faculty members, overall, adopted the Blackboard Vista learning module tool on the lower end of the preparation level on the LoU scale (level 3), but after the migration faculty members adopted the Desire2Learn learning module tool at the lower end of the mechanical level (level 4). Both institutions had a higher average of adopting the Desire2Learn learning module tool compared to the Blackboard Vista learning module tool. The College of Nursing/Health had the highest mean difference of increasing their use of the learning module tool after the LMS migration. Furthermore, all of the colleges adopted the Desire2Learn learning module tool either on the preparation level of the LoU scale (level 3) or on the mechanical level (level 4).

Wimba/Blackboard Collaborate Tool

The sample's overall change in the level of use between the Blackboard Vista Wimba/Blackboard Collaborate tool as compared to the Desire2Learn Wimba/Blackboard Collaborate tool indicated that there was not a statistically significant difference between the Blackboard Vista Wimba/Blackboard Collaborate tool ($M = 2.04$, $SD = 2.00$) and Desire2Learn Wimba/Blackboard Collaborate tool ($M = 2.04$, $SD = 1.69$) level of use, $t(253) = .03$, $p > .05$. This indicates that faculty members are not using the Desire2Learn Wimba/Blackboard Collaborate tool at any higher rates than the Blackboard Vista Wimba/Blackboard Collaborate tool.

Further analysis at the institution level indicated that there was not a statistically significant difference in Institution #1 adoption of the Blackboard Vista Wimba/Blackboard Collaborate tool ($M = 2.14$, $SD = 2.01$) compared to the Desire2Learn Wimba/Blackboard Collaborate tool ($M = 2.25$, $SD = 1.80$) level of use, $t(153) = -.79$, $p > .05$. In comparison, Institution #2 also indicated that there was not a statistically significant in the adoption of the Blackboard Vista Wimba/Blackboard Collaborate tool ($M = 1.89$, $SD = 1.99$) compared to the Desire2Learn Wimba/Blackboard Collaborate tool ($M = 1.71$, $SD = 1.45$) level of use, $t(99) = .89$, $p > .05$.

Table 13, Wimba/Blackboard Collaborate Tool Results by Colleges, below highlights the results of the paired *t* test at the college/school level within both institutions**.** Results from this analysis seem to indicate that no statistically significant difference in faculty members' adoption of the Blackboard Vista Wimba/Blackboard

Collaborate tool compared to the Desire2Learn Wimba/Blackboard Collaborate tool occurred.

Table 13

Wimba/Blackboard Collaborate Tool Results by Colleges

		Blackboard		Desire2Learn		*T* Test
College/School	*N*	*M*	*SD*	*M*	*SD*	
Arts/Science	111	1.89	1.93	1.93	1.67	$t(110) = -0.21$, $p = .84$
Education	63	2.29	1.87	2.40	1.81	$t(62) = -0.64$, $p = .52$
Nursing/Health	21	2.05	2.13	2.05	1.53	$t(20) = 0.00$, $p = 1.0$
Business	24	1.96	2.18	1.88	1.57	$t(23) = 0.16$, $p = .87$
Arts (Fine Arts)	26	1.92	1.94	2.00	1.86	$t(25) = -0.27$, $p = .79$
Academic Centers/Advising	9	2.78	3.03	1.44	1.01	$t(8) = 1.35$, $p = .21$

* $p < .05$

These analyses indicated that overall faculty members did not adopt the Desire2Learn Wimba/Blackboard Collaborate tool at a higher statically significant average compared to the Blackboard Vista Wimba/Blackboard Collaborate tool. Faculty members, overall, adopted the Blackboard Vista Wimba/Blackboard Collaborate tool on the lower end of the orientation level on the LoU scale (level 2) but remained at the lower end of the orientation level after the migration. The College of Education had the highest average of adopting the Desire2Learn Wimba/Blackboard Collaborate at the orientation level on the LoU scale (level 2) and Academic Centers/Advising had the lowest average at the non-use level (level 1).

SCORM Tool

The sample's overall change in the level of use between the Blackboard Vista SCORM tool as compared to the Desire2Learn SCORM tool indicated that there was not a statistically significant difference between the Blackboard Vista SCORM tool (*M* =

1.42, *SD* = 1.40) and the Desire2Learn SCORM tool (*M* = 1.49, *SD* = 1.21) level of use, $t(253) = -.75$, $p > .05$. This indicates that faculty members are not using the Desire2Learn SCORM tool at any higher rates than the Blackboard Vista SCORM tool.

Further analysis at the institution level indicated that there was not a statistically significant difference in Institution #1 adoption of the Blackboard Vista SCORM tool (*M* = 1.53, *SD* = 1.52) compared to the Desire2Learn SCORM tool (*M* = 1.58, *SD* = 1.26) level of use, $t(153) = -.41$, $p > .05$. In comparison, Institution #2 indicated that there was not a statistically significant difference in the adoption of the Blackboard Vista SCORM tool (*M* = 1.26, *SD* = 1.18) compared to the Desire2Learn SCORM tool (*M* = 1.35, *SD* = 1.10) level of use, $t(99) = -.76$, $p > .05$.

Table 14, SCORM Tool Results by Colleges, below highlights the results of the paired *t* test at the college/school level within both institutions. Results from this analysis seem to indicate that no statistically significant difference in faculty members' adoption of Blackboard Vista SCORM tool compared to the Desire2Learn SCORM tool occurred.

Table 14

SCORM Tool Results by Colleges

		Blackboard		Desire2Learn		*T* Test
College/School	*N*	*M*	*SD*	*M*	*SD*	
Arts/Science	111	1.36	1.27	1.40	1.05	$t(110) = -0.29$, $p = .78$
Education	63	1.71	1.75	1.78	1.48	$t(62) = -0.29$, $p = .77$
Nursing/Health	21	1.00	0.00	1.24	0.70	$t(20) = -1.56$, $p = .14$
Business	24	1.08	0.41	1.33	1.17	$t(23) = -1.19$, $p = .25$
Arts (Fine Arts)	26	1.46	1.66	1.54	1.48	$t(25) = -0.25$, $p = .81$
Academic Centers/Advising	9	1.89	2.32	1.44	1.01	$t(8) = 0.61$ $p = .56$

* $p < .05$

These analyses indicated that overall faculty members did not adopt the Desire2Learn SCORM tool at a higher statically significant average compared to the Blackboard Vista SCORM tool. Faculty members, overall, adopted the Blackboard Vista SCORM tool on the lower end of the non-use level on the LoU scale (level 1) but remained at the non-use level after the migration. The College of Education had the highest average of adopting the Desire2Learn SCORM tool and the College of Nursing had the lowest average of adopting the Desire2Learn SCORM tool. Furthermore, according to the mean value Academic Centers/Advising overall use of the Desire2Learn SCORM tool decreased after the migration.

Selective Release Tool

The sample's overall change in the level of use between the Blackboard Vista selective release tool as compared to the Desire2Learn selective release tool indicated that there was a statistically significant difference between the Blackboard Vista selective release tool ($M = 2.52$, $SD = 2.07$) and the Desire2Learn selective release tool ($M = 2.77$, $SD = 2.03$) level of use, $t(253) = -.2.02$, $p < .05$. This indicates that faculty members are using the Desire2Learn selective release tool at any higher rates than the Blackboard Vista selective release tool.

Further analysis at the institution level indicated that there was not a statistically significant difference in Institution #1 adoption of the Blackboard Vista selective release tool ($M = 2.56$, $SD = 2.03$) compared to the Desire2Learn selective release tool ($M = 2.79$, $SD = 1.95$) level of use, $t(153) = -1.44$, $p > .05$. In comparison, Institution #2 there was not a statistically significant difference in the adoption of the Blackboard Vista

selective release tool (M = 2.46, SD = 2.14) compared to the Desire2Learn selective release tool (M = 2.74, SD = 2.15) level of use, $t(99) = -1.43$, $p > .05$.

Table 15, Selective Release Tool Results by Colleges, below highlights the results of the paired t test at the college/school level within both institutions. Results from this analysis seems to indicate a statistically significant difference in faculty members adoption of the Blackboard Vista selective release tool compared to the Desire2Learn selective release tool within the College of Nursing/Health.

These analyses indicated that overall faculty members adopted the Desire2Learn selective release tool at a higher average compared to the Blackboard Vista selective release tool. Faculty members, overall, adopted the Blackboard Vista selective release tool at the orientation level on the LoU scale (level 2) and remained at this level after the migration. The data showed that the College of Nursing/Health increased their use of the Desire2Learn selective release tool after the LMS migration.

Table 15

Selective Release Tool Overall Results by Colleges

		Blackboard		Desire2Learn		*T* Test
College/School	*N*	*M*	*SD*	*M*	*SD*	
Arts/Science	111	2.60	2.13	2.65	1.95	$t(110) = -0.24$, $p = .81$
Education	63	2.56	2.05	3.00	2.03	$t(62) = -1.72$, $p = 0.09$
Nursing/Health	21	2.14	1.59	3.33	2.03	$t(20) = -3.63$, $p = 0.00$*
Business	24	2.21	1.98	2.13	1.75	$t(23) = -.19$, $p = .86$
Arts (Fine Arts)	26	2.38	2.06	2.65	2.33	$t(25) = -1.13$, $p = .27$
Academic Centers/Advising	9	3.33	2.87	3.33	2.55	$t(8) = 0.00$ $p = 1.0$

* $p < .05$

Table 16, Significant Selective Release Tool Results, below highlights the results of the paired t test at only Institution #2's College of Nursing. When conducting a paired t test

at the institution and college/school level, analyses indicated that only Institution #2 College of Nursing had statistical significant results.

Table 16

Significant Selective Release Tool Results

		Blackboard		Desire2Learn		*T* Test
College/School	*N*	*M*	*SD*	*M*	*SD*	
Nursing (Institution #2)	14	2.14	1.70	3.21	2.16	$t(13) = -2.69$, $p = .02$*

* $p < .05$

Null Hypothesis 1.2

To analyze Null Hypothesis 1.2 "There are no significant difference in faculty members' patterns in teaching between the types of courses the faculty member usually teaches and their faculty status while using tools within Blackboard Vista compared to Desire2Learn," a two-way factorial Multivariate Analysis of Variance (MANOVA) was constructed. This MANOVA was tested using the overall rating for responses for the level of use within Blackboard and an overall rating for responses of level of use within Desire2Learn. Faculty members used Section 2 of the survey (see Appendix G) to evaluate their level of use with each identified tool.

To evaluate the use of each tool, the faculty member used the LoU scale to rate how often he or she had used the tool within the Blackboard Vista system compared to the Desire2Learn system. This was the same scale used and discussed in Null Hypothesis 1.1. The LoU based on seven unique levels, the first level being non-use and seventh level being renewal (Hall et al., 1975).

As shown in Table 17, descriptive statistics from MANOVA, more full-time faculty members who teach all online or hybrid courses within the old LMS (Blackboard)

and new LMS (Desire2Learn) had a higher mean compared to any other faculty members that teach in other course categories. Adjunct faculty members who teach a combination of face-to-face and online course in both the old LMS and new LMS had a higher mean compared to any other adjunct faculty members who teach in other course categories. Overall, faculty's responses fell between the orientation (level 2) and preparation level for Blackboard Vista. For Desire2Learn, overall faculty responses fell between the preparation (level 3) and mechanical level (level 4), indicating a lower level of use on the LoU scale. Adjuncts indicated a lower level of use overall for both Blackboard Vista and Desire2Learn than full-time faculty. Based on a comparison of means Desire2Learn had higher level of use for both full-time and adjunct faculty members.

Table 17

Descriptive Statistics from MANOVA

Delivery Format	Blackboard						Desire2Learn					
	Full-time			Adjunct			Full-time			Adjunct		
	M	*SD*	*N*	*M*	*SD*	*N*	*M*	*SD*	*N*	*M*	*SD*	*N*
F2F only	2.36	1.35	74	1.55	.83	21	2.72	1.20	74	1.86	.92	21
F2F and hybrid	3.53	1.32	28	3.10	1.70	6	4.31	0.87	28	4.03	1.60	6
F2F and online	3.62	1.23	13	3.84	0.48	5	4.00	1.23	13	4.10	0.69	5
Hybrid only	3.10	1.37	64	2.41	1.53	14	3.74	1.05	64	2.97	1.02	14
Online and hybrid	3.89	1.09	16	3.21	1.18	13	4.31	.90	16	3.89	0.91	13
All Formats	2.98	1.42	195	2.47	1.40	59	3.50	1.26	195	2.98	1.35	59

According to the significant result of the Box's M test of equality of covariance matrices (Box's M = 57.33, $F(27, 6039) = 1.97$, $p < .05$), the variance-covariance

matrices of each group of residuals were not equal and some severe distortion might be showing in the alpha levels of the tests. Thus, the Pillai's Trace test was chosen to report the MANOVA results for testing Null Hypothesis 1.2. The interaction effect between "faculty status" and "type of course typically taught" on the level of use for both Blackboard Vista and Desire2Learn was not significant (Pillai's Trace = .02, $F(8,488) = .51$, $p > .05$). However, the main effects of "faculty status" and "type of course typically taught" on the level of use for both Blackboard Vista and Desire2Learn were significant (Pillai's Trace = .03, $F(2,243) = 3.36$, $p < .05$; Pillai's Trace = .30, $F(8,488) = 10.56$, $p < .05$). It means that "faculty status" and "type of course typically taught" might be factors that affected faculty's responses to the level of use for both Blackboard Vista and Desire2Learn. Because there were only two types of faculty status in the survey, a post hoc analysis could not be performed. Two one-way ANOVA tests were conducted instead to measure the differences in the level of use for Blackboard and Design2Learn between full-time faculty and adjunct faculty. According to the ANOVA results, full-time faculty rated significantly higher on the level of use for both Blackboard and Design2Learn ($M_{\text{Blackboard}} = 2.98$; $M_{\text{Design2Learn}} = 3.50$) than adjunct faculty ($M_{\text{Blackboard}} = 2.47$; $M_{\text{Design2Learn}} = 2.98$). In addition, the Scheffe' test was chosen for a post hoc analysis of the responses among faculty members who teach different types of course. Based on the results of the post-hoc comparisons, faculty members who teach all-face-to-face courses rated significantly lower than faculty members who teach other types of course on the level of use for both Blackboard and Design2Learn. To see full MANOVA results, see Appendix H.

Null Hypothesis 2.1

To test Null Hypothesis 2.1 "There are no significant differences in faculty members' experience during the migration from Blackboard Vista to Desire2Learn based on the years having taught online or hybrid based courses and gender," a two-way factorial ANOVA was constructed. This factorial ANOVA was tested using a new variable called system usage experience, which computed the overall rating from the mean of all questions answered in Section 3 of the survey (see Appendix G). The system usage experience levels consisted of a 5-item Likert scale ranging from strongly disagree (1) to strongly agree (5).

As shown in Table 18, Comparison of Online/Hybrid Teaching and Gender for Overall Experience, more female faculty members participated compared to male faculty members. Only one female faculty member reported that she had more than 20 years of experience teaching online or hybrid based courses while only one male faculty member reported that he had 16-20 years of experience teaching online or hybrid based courses. These two faculty members were the highest in the number of years having taught online or hybrid based courses. Both females and males with 1-5 years of experience teaching online or hybrid based courses participated the most in this section of the survey compared to any other category. Overall most of the faculty members who participated in this section of the survey had less than 5 years of experience teaching online or hybrid based courses. Given that the survey questions in this section were phrased in the negative condition, male faculty members' overall responses ranged from 1.78-3.17. This indicates that male faculty members' strongly disagree (meaning have a positive experience) to neither agree nor disagree. Female faculty members' overall responses

ranged from 1.78-2.94. This indicates that female faculty members' strongly disagree (meaning have a positive experience) to somewhat disagree.

A two-way factorial ANOVA was used to evaluate whether gender of the faculty member and the years of actively teaching online or hybrid-based courses affected the system usage experience of using Desire2Learn after migration. The 2 X 2 between-subjects analysis of variance failed to reveal a main effect of gender, $F(1, 254) = 0.12$, $MS_e = .07$, $p > .05$. In addition, the same 2 X 2 between-subjects analysis of variance failed to reveal a main effect of years of experience teaching online or hybrid based courses at higher education institutions, $F(5, 254) = 1.56$, $MS_e = .90$, $p > .05$. This two-way factorial ANOVA revealed that there were no significant differences in the means for system usage experience based on gender and years of experience teaching online or hybrid based courses at higher education institutions, $F(4, 254) = .33$, $p > .05$.

Table 18

Comparison of Online/Hybrid Teaching and Gender for Overall System Usage Experience

Years Experience Teaching Online/Hybrid	Gender					
	Male			Female		
	M	*SD*	*N*	*M*	*SD*	*N*
< 1 year	2.96	0.65	37	2.89	0.69	55
1-5 years	2.80	0.82	40	2.87	0.73	62
6-10 years	2.74	0.80	12	2.71	0.75	23
11-15 years	3.17	0.95	10	2.94	1.14	11
16-20 years	1.78	0	1	2.39	0.24	2
> 20 years	0	0	0	1.78	0	1
Total	2.88	0.78	100	2.85	0.75	154

These results indicate that overall system usage experience is not determined by the number of years a faculty member has at teaching online or hybrid courses. In comparison, the same overall system usage experience is not determined by the gender of the faculty member. Lastly, when combining these two independent variables (years of having taught online or hybrid based courses and the gender), no statistically significant results occurred.

Null Hypothesis 3.1

To test Null Hypothesis 3.1 "There are no significant differences in faculty members' use of various training and support options based on the years of experience using an LMS and the years having taught online or hybrid courses," a two-way factorial ANOVA was constructed. This ANOVA was tested using a new variable called training, which computed the overall rating from the mean of all questions answered in Section 4 of the survey (see Appendix G). The learning scale consisted of consisted of a 5-item Likert scale ranging from never (1) to always (5).

As shown in Table 19, Comparison of Years of LMS Experience and Online/Hybrid Teaching Experience for Training, more faculty members who had less than 1 year of teaching online or hybrid courses but more than 5 years using an LMS other than Blackboard Vista and Desire2Learn had a higher mean compared to any other faculty members in additional categories. Only one faculty member reported that s/he had 11-15 years of teaching online or hybrid courses and more than 5 years using an LMS other than Blackboard Vista and Desire2Learn; this response was the lowest mean compared to any other faculty members. This indicates that this faculty member used fewer technical support options, both provided by the university and not provided by the

university, than any other faculty member. In addition, more faculty members who had 1-5 years of teaching online or hybrid courses completed the survey instrument compared to any other faculty grouping. Overall, faculty members' responses ranged from a mean of 1.67-2.92, equating to the never to rarely categories on the learning scale. This indicates that faculty members used fewer university or external resources when learning to use Desire2Learn after the implementation of the new LMS.

Table 19

Comparison of Years of LMS Experience and Online/Hybrid Teaching for Training

Years Experience Teaching Online	Year of Experience using an LMS other than Blackboard and Desire2Learn											
	< 1 year			1-3 years			4-5 years			> 5 years		
	M	*SD*	*N*	*M*	*SD*	*N*	*M*	*SD*	*N*	*M*	*SD*	*N*
< 1 year	1.94	.75	66	2.34	.97	19	2.33	.33	3	2.92	.82	4
1-5 years	2.43	.67	46	2.60	.56	38	2.63	.61	12	2.89	.99	6
6-10 years	2.40	.72	12	2.56	.66	12	2.38	.16	4	2.36	.43	7
11-15 years	2.52	.90	8	2.81	.50	9	2.39	.59	3	1.67		1
16-20 years			0	2.75	.82	2	2.83		1			0
> 20 years			0						0	2.50		1
Total	2.19	.76	132	2.56	.69	80	2.52	.50	23	2.61	.76	19

Prior to analysis, the data was checked for adherence to statistical assumptions. Levene's test showed that the assumption of equal variances was not violated ($F(18, 235) = 1.45$, $p > .05$).

A two-way factorial ANOVA was used to evaluate whether the years of actively teaching online or hybrid-based courses at higher education institutions and the years of using an LMS other than Blackboard Vista and Desire2Learn affected whether a faculty member participated in Desire2Learn training activities. The 2 X 2 between-subjects analysis of variance failed to reveal a main effect of the years of actively teaching online or hybrid-based course, $F(5, 254) = 0.75$, $MS_e = .38$, $p = > .05$. In addition, the same 2 X 2 between-subjects analysis of variance failed to reveal a main effect of years of using an LMS other than Blackboard Vista and Desire2Learn, $F(3, 254) = .87$, $MS_e = .43$, $p > .05$. This two-way factorial ANOVA revealed that there were no significant differences in the means for whether a faculty member participated in Desire2Learn training activities based on years of actively teaching online or hybrid-based courses at higher education institutions and the years of using an LMS other than Blackboard Vista and Desire2Learn, $F(10, 254) = .88$, $p > .05$.

These results indicate that the overall training level is not determined by a faculty member's number of years having used an LMS outside of Blackboard Vista or Desire2Learn. In comparison, the same overall training level is not determined by the number of years a faculty member has had at using teaching online or hybrid courses. Lastly, when combining these two independent variables (year of using an LMS outside of Blackboard Vista and Desire2Learn and years having taught online or hybrid courses), no statistically significant results occurred.

Open-Ended Analysis

To analyze the five open-ended questions, each question's response was downloaded into a Microsoft Excel tab to create one large workbook. Upon reading all responses, a category was produced for each question's responses. Next, each question was re-read and a color category was assigned to every response. After all color categories were assigned, a final verification was made to each category to ensure that they were appropriate. Finally, the data was reviewed to determine any major themes and patterns to write the analysis.

Question 1

Two hundred and sixty-five faculty members responded to the question, "After the migration to Desire2Learn, have you changed your use of tools for teaching? If so, how?" Three common themes emerged that included no change, slight change, and significant change. Overall, 173 participants (65.28%) responded that they did not change their use of LMS tools after the migration to Desire2Learn. Further analyses indicated that Institution #1 had the most faculty members that did not change their use of LMS tools after the migration to Desire2Learn (97 participants, 56.07%) compared to Institution #2 (76 participants, 43.93). Notable quotes included:

Faculty member #76 (Institution #2) "No changes were necessary."

Faculty member #216 (Institution #1): "No, I have not really changed the tools I use when teaching."

For the second theme, 53 participants (20%) responded that they slightly changed their use of LMS tools after the migration to Desire2Learn. Analyses indicated that Institution #1's College of Arts and Sciences (10 participants, 18.87%) and Institution

#2's College of Letters and Sciences (18 participants, 33.96%) had the most faculty members that slightly changed their use of LMS tools. Furthermore, Institution #2 (33 participants, 62.26%) had the most faculty members to indicate that they slightly changed their use of LMS tools compared to Institution #1 (20 participants, 37.74%). Notable quotes included:

Faculty Member #182: "Used to use folders rather than modules. Had to change that."

Faculty Member #255 "Somewhat. Would like to learn more."

The last theme, 39 participants (14.72%) stated that they significantly changed their use of LMS tools after the migration to Desire2Learn. Analyses indicated that both Institution #1's (17 participants, 43.49%) and Institution #2's (11 participants, 28.21%) College of Education faculty members significantly changed their use of LMS tools compared to any other college/department. In addition, Institution #1 (23 participants, 58.97%) had the most significant change compared to Institution #2 (16 participants, 41.03%).

Notable quotes included:

Faculty Member #29: "I create more modules on D2L and have richer content published there."

Faculty Member #219: "I use the Assessments and Selective Release tools more in D2L."

For additional quotes related to Open-Ended Question #1, see Appendix B.

Question 2

Two hundred and fifty-five faculty members responded to the question, "Please provide a list of additional experiences faced during the migration process from Blackboard Vista to Desire2Learn." Three common themes emerged. These themes were no issues, minor complications, and serious complications that caused the user to not want to use Desire2Learn. Overall, 163 participants (63.9%) responded that they did not have any additional issues faced during the migration process. Analyses indicated that Institution #2 had the most faculty members that reported no additional issues faced (86 participants, 52.76%) compared to Institution #1 (77 participants, 47.24%). Furthermore, both Institution #1's (62 participants, 80.52%) and Institution #2's (59 participants, 68.60%) College of Education and Human Services had the highest faculty member to report no additional issues faced during the migration compared to any other college/department.

Notable quotes included:

Faculty member #111: "It was a good experience for me."

Faculty member #119: "Migration was easy and no anxiety was involved."

For the second theme, 67 participants (26.3%) responded that they had minor complications during the migration to Desire2Learn. Analyses indicated that Institution #2's College of Letters and Sciences (49 participants, 73.13%) and Institution #1's College of Arts (18 participants, 26.87%) had the most faculty members to indicate that they experienced minor complications during the migration to Desire2Learn.

Notable quotes included:

Faculty member #52: "I did not have too many problems except with format."

Faculty member #122: "Migration, for the most part, went smoothly. Had to tweak some content areas, but expected to do so. Experienced a bit of a learning curve to use Desire2Learn tools."

The last theme, 25 participants (9.8%) stated that they had serious complications that caused them to not want to use Desire2Learn. Overall, Institution #1 had 14 participants (56%) that reported having serious complications compared to Institution #2 who had 11 participants (44%). In addition, both Institution #1's (9 participants, 64.29%) and Institution #2's (7 participants, 63.64%) College of Arts and Sciences had serious complications.

Notable quotes included:

Faculty member #18: "Desire2Learn has WAY, WAY more features than most us really need and that becomes its own hindrance."

Faculty member # 17: "Desire2Learn has crushed my desire to learn!"

Faculty member #67: "I have found that Desire2Learn has useful features that USG institutions do not have access to. We were told that Desire2Learn would come with analytic features that we have not see so far."

For additional quotes related to Open-Ended Question #2, see Appendix B.

Question 3

One hundred and eight-one faculty members responded to the question, "What other types of strategies have you used to overcome the difficulties of using Desire2Learn?" Five common strategies were identified. These strategies include, in the order of most used to least used: calling the I.T./Desire2Learn phone support, trial and error, asking co-worker, self-taught and other methods. Overall, 75 participants (41.44%)

reported that they frequently called the I.T./Desire2Learn phone support. Analyses indicated that Institution #1 called the I.T./Desire2Learn phone support the most (45 participants, 60%) compared to Institution #2 (30 participants, 40%).

Notable quotes included:

Faculty member # 7: "Asking help from eLearning group directly. I need human interface and colleges."

Faculty member #82: "Initially I called the 24/7 Desire2Learn hotline quite a few times."

For the second and third theme, 42 participants (23.20%) responded that they frequently used trial and error and 24 participants (13.26%) responded to regularly attending a training session(s). When comparing these Institution #1's (26 participants, 61.90%) faculty members used mostly trial and error methods compared to Institution #2's (16 participants, 38.10%) however Institution #2's (15 participants, 62.5%) faculty members used training sessions more compared to Institution #1 (9 participants, 37.5%).

Notable quotes included:

Faculty member #170: "Trial and error. A sandbox was created for us and sometimes I would try something in the sandbox course to see if I could get it to work before I would try it in my own course."

Faculty member #135: "The required training session was essential."

For the fourth and fifth theme, 21 participants (11.60%) responded to frequently asking a co-worker for assistance and 19 participants (10.50%) to teaching themselves (self-taught). Institution #1 responded more to asking a co-worker (14 participants, 66.67%) compared to Institution #2 (7 participants, 33.33%). Both Institution #1's and

#2's College of Letters/Arts and Sciences used the asking a co-worker method the most compared to any other college/department. Institution #1 used the self-taught method the most (11 participants, 57.89%) compared to Institution #2 (8 participants, 42.11%). In addition, both Institution #1 and 2 College of Education faculty members (10 participants, 52.63%) used the self-taught method compared to other college/departments.

Notable quotes included:

Faculty member #113: "Primarily use staff assistance and copying from another faculty member."

Faculty member #123: "Self exploration of Desire2Learn."

For additional quotes related to Open-Ended Question #3, see Appendix B.

Question 4

Two hundred and forty-seven faculty members responded to the question, "What tools or enhancements within Desire2Learn have you found to be the most beneficial when teaching online, hybrid, or traditional face-to-face courses?" Many faculty members that responded to this question mentioned one or multiple tools in which they believed had been beneficial when delivering instruction. While many faculty members reported multiple tools within their response, a tally of each tool mentioned was created. Overall, the six top tools, in the order of the most beneficial, were the grade book (54 participants mentioned, 23.4%); learning module (44 participants mentioned, 19.0%); drop box (36 participants mentioned, 15.6%); discussion board (34 participants mentioned, 14.7%); assessment (33 participants mentioned, 14.3%); and news/announcement (30 participants mentioned, 13%). A few faculty members indicated

that none of the tools within Desire2Learn were beneficial. Some prominent quote included:

Faculty member #186: "None, I find it (Desire2Learn) to be worse."

Faculty member #190: "None. The two systems deliver readings to my students equally well."

Faculty member #192: "Not aware of any enhancements that are useful."

Question 5

One hundred and sixty-eight faculty members responded to the question, "What changes or recommendations should be made for future LMS migrations?" Four common themes emerged, which included more time to learn the system, more training and instruction, reconsider other LMS, and no comments or improvement necessary. Overall, 24 participants (14.3%) responded that for future migrations the university or college must provide more time to learn the system. Institution #1 (16 participants, 66.67%) stated that more time is needed compared to Institution #2 (8 participants, 33.33%). Notable quotes included:

Faculty member #88: "It would be nice to allow faculty who use the LMS to see the new system in advance of the school year."

Faculty member #112: "More time to learn the system well before teaching."

For the second theme, 86 participants (51.2%) responded that they believed more training and instruction needs to occur during future LMS migration. Institution #1 (52 participants, 60.47%) stated that more training needs to be provided compared to Institution #2 (34 participants, 39.53%). In addition, Institution #2's College of Arts and Sciences (14 participants, 41.18%) had the highest number of faculty members to indicate

that more training needs to be provided compared to any other college/department within the institution. Furthermore, Institution #1's Arts and Sciences (29 participants, 55.77%) had the highest number of faculty members to indicate the same theme compared to any other department/college within the institution. Notable quotes included:

> Faculty member #128: "Offer training session on a variety of days so that more faculty can attend."
>
> Faculty member #144: "Simple, clear instructions with one-to-one matchups showing the old and new paralleled."

For the third theme, 19 participants (11.3%) stated that the university should reconsider another LMS. Institution #1 (10 participants, 52.63%) had the highest number of faculty members to state this recommendation compared to Institution #2's (9 participants, 47.37%) faculty members. Further analyses indicated that Institution #1's College of Education (5 participants, 50%) had the highest number of faculty members to suggest that universities should reconsider another LMS compared to Institution #2's College of Education (2 faculty members, 22.22%). Notable quotes included:

> Faculty members #39, 50, and 51: "Go back to Blackboard."
>
> Faculty member #94: "Look into Moodle, if not that, go with Blackboard."

For the final theme, 39 participants (23.2%) indicated that no improvements were necessary. Additional analyses indicated that Institution #2's (20 participants, 51.28%) faculty members thought no improvements were necessary compared to Institution #1's (19 participants, 48.72%). Institution #2's College of Letters and Sciences (13 participants, 65%) had the highest number of faculty members to indicate that no changes

were needed compared to Institution #1's Arts and Sciences (8 participants, 42.11%). Notable quotes included:

Faculty member #62: "I do not have any recommendations so far."

Faculty member #122: "No changes are really required. Keep inviting faculty and keep making participation easy."

For additional quotes related to Open-Ended Question #5, see Appendix B.

Summary

Data gathered through the survey instrument was analyzed using descriptive statistics, *t* tests, ANOVAS, a MANOVA, and inductive analysis. The survey instrument was proved to be both valid and reliable, along with Cronbach α values provided earlier in this chapter.

Chapter IV

DISCUSSION

The purpose of this chapter is to discuss the findings of the research study. This chapter is divided into three sections: (1) summary of the study, including a review of the purpose, shortened review of literature, and overview of the methods and procedures used for analysis of data; (2) conclusions drawn from the findings described by answering each research question; and (3) suggestions for further research.

Summary of the Study

In order to successfully integrate instructional systems, like learning management systems, into various curriculums, the need to examine faculty members' acceptance and use of these systems is very important. The purpose of this study was if faculty members' patterns in teaching, through the use of various tools within the new LMS, were different as compared to the previous LMS. The study also investigated what challenges faculty members faced and the level of support and training used during the migration. Several factors that were considered throughout the study included: the years of experience using the old and new LMS, tool use, types of courses taught, and the level of overall system usage and support and training used during the migration.

A number of models are used today in the technology acceptance and adoption research field. Some of the most common models are the technology acceptance model (TAM) (Davis, 1989), UTAUNT (Venkatesh et al., 2003), level of use of the innovation (LoU) (Hall et al., 1975), and diffusion of innovation theory (Rogers, 2003). The TAM

and LoU models were selected to be the frameworks used to guide this research study. The TAM believes that end-users acceptance of technology can be categorized into two main groups: perceived usefulness and perceived ease of use. Within both of these groups, many external variables exist which include user training, user involvement during the design/development process, prior experiences, and nature of the implementation process. Ultimately, the TAM states that if perceived usefulness and perceived ease of use is achieved then the end-user will accept the technology or system (Davis, 1989). In comparison, the LoU helps to determine at what level or stage the end-user is currently adopting and integrating the innovation in their daily use. Overall the LoU is comprised of seven levels, the first level being non-use to the seventh level being renewal. End-users begin with the non-use level as they are first introduced to the innovation and move through the remaining six levels as they continue to use the innovation. The creators of the LoU strongly suggest that not all users will experience all seven levels (Hall et al., 1975).

An extensive literature review found that, often, educators have to change their patterns in teaching in order to adopt news roles when teaching online or hybrid based courses (Harper et al., 2004; Moore & Kearsley, 1996; Skylar, 2004; Tallent-Runnels et al., 2006). These studies suggest that universities and colleges must identify the types of tools, technologies, and methods to be used in distance education and that faculty members must be willing to accept these tools, technologies, and methods into their own teaching. One common tool that most universities, colleges, and faculty members have used to effectively deliver instruction is a learning management system (LMS). Often as technology improves, universities and colleges have decided to migrate from one LMS to

another LMS. Previous studies concluded four critical items that a college or university must consider during the migration are: 1) understand both the advantages and disadvantages to using an LMS; 2) determine why a faculty member adopts an LMS within in their classroom; 3) understand the various roles and competencies faculty members will need to be successful at using; and 4) after determining these roles and competencies, provide faculty members with the best training and support to using the LMS (Benson & Palaskas, 2006; Ge et al., 2010; Ryan et al., 2012). The results of these studies were used as guidelines to determine if the same themes in this study were generated.

Three research questions were addressed in this study. The three research questions were as follows:

1. To what extent have faculty members changed their patterns in their use of tools (e.g., announcements/news, discussions, grades, etc.) within Desire2Learn compared to Blackboard Vista?
2. What are the challenges faculty members encountered during the migration from Blackboard Vista to Desire2Learn as influenced by gender and hybrid and online teaching experience?
3. What level of support and training was used by faculty members during the migration of Blackboard Vista to Desire2Learn?

To answer these research questions, four null hypotheses were addressed. The four null hypotheses were as follows:

1.1 There are no significant differences in faculty members' patterns in their use of tools within Blackboard Vista compared to Desire2Learn.

1.2 There are no significant difference in faculty members' patterns in teaching between the types of courses the faculty member usually teaches and their faculty status while using tools within Blackboard Vista compared to Desire2Learn.

2.1 There are no significant differences in faculty members' experience during the migration from Blackboard Vista to Desire2Learn based on the years having taught online or hybrid based courses and gender.

3.1 There are no significant differences in faculty members' use of various training and support options based on the years of experience using an LMS and the years having taught online or hybrid courses.

The first research question was answered by addressing two null hypotheses ($H_0$1.1 and $H_0$1.2). The second research question was answered by one null hypothesis ($H_0$2.1). The third research question was answered by one null hypothesis ($H_0$3.1).

To collect data for this study, a survey instrument was developed based on the TAM and LoU frameworks and deployed to faculty members at two regional universities within the state of Georgia. The instrument that was used underwent both reliability and validity testing. The sample included all faculty members (full-time and adjunct) within all colleges and departments at each of the universities. Overall, faculty members had roughly two months to complete the survey, along with multiple email reminders sent asking for participation. After the survey closed, all responses were downloaded from Qualtrics (system hosting the survey instrument) and the results were imported into SPSS for analysis. The results of the tests were presented in Chapter 4 of this study. The data

was analyzed using descriptive statistics, *t* tests, ANOVAs, a MANOVA, and inductive analysis coding techniques.

Discussions of the Findings

The following paragraphs provide a summary of the findings and discussions of the results for each hypothesis presented in Chapters 3 and 4. The discussions are presented by each research question.

Research Question 1: To what extent have faculty members changed their patterns in their use of tools (e.g., announcements/news, discussions, grades, etc.) within Desire2Learn compared to Blackboard Vista?

Given that a LMS has multiple tools (e.g. announcements, grade book, discussions, etc.), each LMS tool was examined separately by performing *t* tests at the overall, institution, and college/school levels. All of the tools examined were utilized at statistically higher rates in Desire2Learn, with the exception of Wimba/Blackboard Collaborate and using SCORM content. Blackboard Vista and Desire2Learn LMS contain external tools such as SCORM content, which requires access to software such as Adobe Captivate, Camtasia, Articulate, etc., and Wimba/Blackboard Collaborate. Given that these tools are outside of the LMS, some may suggest that these tools should not be considered true tools because they are not embedded within the LMS. Provided this fact, faculty members adopted all of tools within the LMS at a higher rate in Desire2Learn compared to Blackboard Vista.

When investigating the usage of Desire2Learn tools mentioned above at the school/college level, various schools/colleges adopted certain tools at higher rates compared to others. The College of Education had the most statically significant results

of any other college when comparing their use of Blackboard Vista LMS tool use to Desire2Learn tool use. The Academic Center/Advising, along with the College of Business, had the least statically significant results of any other college. These results align with previous research studies that suggests that due to their professional training, College of Education faculty members, have a stronger background in instructional design and should integrate more technologies into their curriculum and teaching more readily (Sahin, 2008).

These findings support much of the literature discussed in Chapter 2. Little-Wiles and Naimi (2011) stated 87% of faculty members always use or sometimes use an LMS when delivering instruction. Results of this study indicated that faculty members do use an LMS and frequently adopt the various tools of the LMS, when the perceived ease of use is apparent. Through further analysis of the open-ended question for this section of the survey, results suggested that some faculty members have drastically changed their use of the LMS and its tools. Black et al. (2007) stated that faculty members would adopt an LMS if the system supports them with different content area, philosophies, and instructional styles. One of the leading frameworks used to ensure proper design of online and hybrid based courses is through the Quality Matters rubric. A number of the faculty members stated they changed their use of the LMS to adopt and conform to the Quality Matters rubric. These faculty members indicated that the tools within the LMS helped them better align the design of the course to meet these standards.

To determine if faculty status and type of courses typically taught had an effect on overall levels of use, a MANOVA was performed. As stated in Chapter 4, the interaction effect between faculty status and type of course typically was not significant but the main

effects of "faculty status" and "type of course typically taught on the level of use for both Blackboard Vista and Desire2Learn were significant. Results indicated that full-time faculty members had a significantly higher level of use for both Blackboard Vista and Desire2Learn compared to adjunct faculty members. In addition, those faculty members who teach face-to-face courses had a significantly lower level of use compared to those faculty members who teach online or hybrid courses.

Gautreau (2011) stated that one major factor in LMS tool adoption is a faculty member's tenure status. Provided that tenure-track and tenured professors are full-time employees and adjuncts are not, support why more full-time faculty members adopted LMS tools compared to adjunct instructors. While many LMS trainings are offered during the day and full-time faculty members can attend these trainings, it is important to offer similar opportunities to adjunct instructors. Offering online sessions of the same training or recording the face-to-face trainings and providing a video for adjuncts to review could help improve adjusts levels of use.

Also results found faculty members who teach face-to-face courses had a significantly lower level of use compared to those faculty members who teach online or hybrid courses. In Bonnel and Boehm (2011) study some faculty members stated that in the face-to-face environment, s/he return student's papers, quizzes, and exams in-class and do not see the value of using LMS tools. However, in the online environment the instructor has to rely on LMS tools (e.g., grade book, announcements, discussions, etc.) to keep students informed and to deliver instruction. According to Al-Busaidi (2009) pedagogy training should be offered to faculty members on how to use and integrate the LMS tools within all classroom deliver environments. If universities and colleges offer

specialized training to faculty members who teach in the face-to-face environment on how to integrate LMS tools within the classroom, they may have a better understanding of the benefits of using these tools.

Research Question 2: What are the challenges faculty members encountered during the migration from Blackboard Vista to Desire2Learn, as influenced by gender, faculty status, and hybrid and online teaching experience?

With any new system, the overall system usage experience will most likely vary from one user to another user. In this study, the system usage experience was evaluated on a 5-item Likert scale ranging from strongly disagree (1) to strongly agree (5). Faculty members were provided various difficulties faced (e.g., Desire2Learn runs slower, additional plugin were required, etc.) in which they had to rank their system usage experience. Overall, faculty members stated that Desire2Learn was neither a complex or easy to use system compared to Blackboard Vista ($M = 3.05$) and Desire2Learn does not work any different in various browsers ($M = 3.34$). These results are based on the fact that a 3 on the system usage experience scale was neither agree or disagree. Further, one of the main issues with the previous LMS (Blackboard Vista) was the timeout issue; faculty members would stop working for 30 minutes and would have to sign back into the LMS, losing any unsaved work in the process. This received the lowest score within Section 3 ($M = 2.56$). Overall, this means that Desire2Learn improved over the Blackboard Vista LMS, given that a 2 on the system usage experience scale indicated somewhat disagree. In addition, faculty members provided that fewer plugins have to be installed compared to Blackboard Vista ($M = 2.82$) and Desire2Learn runs faster than Blackboard Vista ($M = 2.73$). Again, given that a 2 on the system usage experience scale

indicated somewhat disagree and the questions were written in a negative format. Provided the above information, overall faculty members responded that Desire2Learn was a better and more stable LMS compared to the Blackboard Vista LMS.

These results indicated the overall faculty members' perceived ease of use is higher compared to the Blackboard Vista LMS. The perceived ease of use is one of the two indicators within the TAM model. As mentioned in Chapter 2, Venkatesh and Davis (2000) suggested that improving the interface of the system to be more end-user friendly is one of the biggest ways to improve perceived ease of use. Given the results of the study, faculty members believed that the Desire2Learn interface has been improved over the Blackboard Vista interface and easier to navigate and use.

Another key external variable within the TAM is the attitude of the end-user. A few faculty members in their open-ended responses indicated that they have wanted to use a more updated LMS, given that the university was using an LMS that was no longer supported by Blackboard themselves. Provided that these faculty members wanted to use a new LMS, their attitude at adopting and learning to use a new LMS could have helped contribute to reasons why faculty members believe Desire2Learn has been a better system.

This study found that gender and the years of having taught online or hybrid-based courses had no effect on the overall system usage experience (Null Hypothesis 2.1). Although more females participated in this study, results indicated that gender did not have a statistically significant effect on the overall system usage experience.

Research Question 3: What level of support and training was used by faculty members during the migration of Blackboard Vista to Desire2Learn?

The level of support and training as defined in this study refers to the overall level that faculty members used the resources provided to them to learn the new LMS, Desire2Learn. These resources included phone support, tutorials, handouts, co-workers, and internal trainings within the university and also using external resources, such as the Internet or other outside of university help. The TAM advocates that one of the critical external variables that will determine if a user will accept or not accept a technology innovation is the level of training and support provided and used by the end-user (Venkatesh & Davis, 1996).

Overall, faculty members least used outside resources, such as the Internet (M = 2.10) compared to university e-learning tutorials (M = 2.39) or attending training or workshops (M = 2.79). Faculty members evaluated their use of various training and support options based on a 5-item Likert scale ranging from never (1) to always (5). These results indicated that faculty members 'rarely' to 'sometimes use' the training or support tools provided to them. As stated in Chapter 2, Ryan et al. (2012) specified that faculty members did not attend much of the training or used the resources that the university had provided them. In addition, faculty members indicated that the support and training level was low because the university did not provide multiple opportunities to attend training, receive instructional support, etc. One of the common themes after investigating the open-ended questions within Section 4 of the survey was that faculty members made the same suggestions as in Ryan et al. study. For an example, a few faculty members stated that they wished the university had held training sessions on different times and days. Again, as stated in Chapter 2, Ryan et al. strongly urged universities to offer multiple training options or even train faculty members by

departments. College administrators and instructional support teams must recognize that faculty members have various schedules and cannot always meet at specific times for training on a short notice. Providing faculty members with a set schedule, a few months in advance, will offer them the opportunity to plan their teaching and research schedule around the various training options being offered. Another suggestion to college administrators is to deliver training options using online synchronous technologies. This could even allow adjunct faculty members to attend training sessions while at their other place of employment.

In addition to investigating at what level faculty members used training resources, this study investigated if the overall level of training level used was influenced by the years of experience using an LMS and the years of having taught online or hybrid courses (Null Hypothesis 3.1). Results indicated that these two independent variables had no effect on the level of support and training faculty members used. Further analysis of the open-ended questions indicated that faculty members received the most help on troubleshooting their issues by calling the IT Help Desk. Having a technical support line for the end-user (faculty members) to call to receive immediate help often ensures that the organization is dedicated and want to make sure their issues are resolved in a positive and quick matter. Thus, many faculty members in their open-ended response indicated that receiving the support from the IT Help Desk made their transition better because these technicians provided them with immediate responses and help. By receiving this immediate help, faculty members were able to better serve their students and continue teaching their courses with minimal interruptions. Ultimately, with faculty members calling the IT Help Desk and having a positive experience ties back into the TAM model.

The TAM states that one of the external variables of end-user technology adoption is the user's previous experience with the system. Provided that most faculty members had a positive experience with this migration by receiving immediate help through the IT Help Desk, when the next migration occurs these faculty members will be more willing to change to a new LMS (or other university system) because of their previous experience.

Conclusions

Three prominent conclusions emerged from this study to include (1) tool adoption use varies among faculty members and among different colleges/departments; (2) having ample training and support options; and (3) different overall system usage experiences.

Tool Adoption Varies Among Faculty and Colleges/Departments

Faculty members were asked to rate their use of various tools within the old LMS compared to the new LMS. While most of the tools within the new LMS had a statistical significance, faculty members mostly adopted these tools between levels 2 and 3 (orientation and preparation) on the LoU. This indicated that faculty members have a much lower level of use with these tools when delivering classroom or online instruction. The TAM states that in order for users to adopt a technology innovation, perceived ease of use and usefulness must be achieved (Davis, 1989). It was noted that some faculty members stated that they did not use or plan to use Desire2Learn. This conclusion is meaningful based on the TAM. If faculty members had viewed Desire2Learn in the same manner as Blackboard Vista, their perceived use or usefulness was greatly lowered, thus resulting in a lower level of use.

In addition, various colleges/schools had overall different levels of use when compared to other college/schools. Previous studies indicated that if faculty member had

to develop online course content and material, some of these faculty members adopted LMS tools on the minimum level (Ge et al., 2010). The two participating universities in this study have different traditional, hybrid, and online courses and degree programs. For those degree programs that are all hybrid and online, faculty members have to use the LMS to deliver instruction and adopt some LMS tools. Overall, College of Education faculty members had a higher statistical level of use in Desire2Learn's tools compared to any other department. This was due to that fact that both universities in the study had multiple online/hybrid degree programs. In comparison, the Academic Center/Advising and College of Business had the lowest level of use. Often Academic Center/Advising staff work face-to-face with students on study skills, academic skills, and essential skills to be successful in college. Further, both of these universities' College of Business do not offer many online/hybrid courses or degree programs. This conclusion is very important for college administrators. When deciding to deploy hybrid or online degree programs it is important to do what previous studies indicated by explaining to faculty members the various roles they will have to play and the expectation of teaching online.

Having Ample Training and Support Options

Faculty members were asked to rate their use of various training and support options (e.g., calling the IT Help Desk, asking a co-worker, attending a training session, etc.) by determining how often they used these support resources. Most of the faculty members called the IT Help Desk for assistance, attending a training workshop, and/or asked a co-worker for assistance. Davis (1989) suggested that a company might improve the perceived ease of use by providing better and more efficient training to the end-user. In this study many faculty members indicated in the open-ended questions that while they

attended the training workshops, the times of these workshops were not convenient in their schedule. Further, a few faculty members mentioned that by asking fellow co-workers on how to perform a task(s) within Desire2Learn and having this co-worker state that they had the same issue helped the faculty member not feel as challenged or afraid to experiment with new features.

This conclusion supports Ryan et al. (2012) findings that suggested that administrators and trainers must provide training around faculty members' schedules. One strategy or technique is to train faculty members during department meetings or in smaller groups. It is extremely important to provide this training upfront to faculty members and not as the LMS is being released to students. Often students will email faculty members on using the LMS and faculty members can get overwhelmed if they are learning how to troubleshoot and learn the system along with these students. Also, a few faculty members stated they were trying to learn LMS tools to align with the Quality Matters rubric. This brings another conclusion, which is the need for more university support on hiring additional instructional designers. Many universities have implemented centers for teaching excellence, in which these centers provide instructional design services and online/distributed learning pedagogy training. In this study, faculty members appreciated the phone and/or email support, but a few stated they wished more hands on and one-on-one training was provided. By having a center for teaching excellence faculty members can attend various workshops or work individually with instructional designers on learning how to use the LMS along with the correct pedagogy on implementing course curriculum.

Different Overall System Usage Experiences

Faculty members were asked to rate their overall system usage experience (e.g., they were well formed about the migration, Desire2Learn works differently in various browsers, etc.) using a 5 Likert scale. It is important to note that the questions on the survey instrument were phrased in a negative format. Faculty members responded to most of the questions by answering a 1 or 2 (strongly disagree or disagree). This indicated that faculty members had a positive experience during and after the migration. According to Ryan et al. (2012) two of the overall system usage experience challenges were informing faculty members on the migration (import dates and what to expect) and what content would easily transfer from the old LMS to the new LMS. Faculty members in this study believed that college administrators well informed them of what content would transfer from Blackboard Vista to Desire2Learn, along with key dates that the migration would take place.

In conclusion the result of the study support Ryan et al. (2012) findings. College administrators and technical support staff must clearly inform faculty members about key dates and other important information prior to the migration not during or after the migration. A few faculty members in the open-ended questions stated that this migration did not take into account courses offered every few years (courses offered on a rotation base) and the universities disabled some features within the new LMS. Many of these features were tools that allowed for analytics to be performed. Another conclusion is to have a post-migration survey and determine what are faculty members concerns for college administrators to address. By having faculty communities of practice focusing on post migration challenges and concerns would be a great suggestion for universities and

colleges. Based on the fact that many faculty members in this study were open to receiving help from their colleagues, having communities of practice could allow faculty members to openly discuss their concerns and propose solutions to college administration.

Recommendations for Future Research

A number of recommendations can be offered for future research as a result of this study. First, is to conduct this study to include graduate and teaching assistants in the sample. The participants of this study were faculty members who were either full-time or adjunct. Many graduate and teaching assistants are students who work with faculty members to deliver instruction or are the primary instructor on record for various courses. In addition, most universities and colleges today have graduate and teaching assistant training programs in which it is strongly recommended to learn technologies, such as an LMS, given that more course are being delivered in a hybrid or online environment.

Second, is to include various types of universities and colleges. Often college and university environments can differ from those of another; there are some universities and colleges where faculty members main priority is focused on teaching, research, or some a combination of both research and teaching. Faculty members could implement and adopt an LMS at different levels depending on their priority. For example, those faculty members whose priorities are more focused on teaching could have more available time to focus on improving their course compared to those more focused on research. Also a similar concept could be applied to a faculty member's rank within the university. Often various ranks include: Instructor, Senior Instructor, Assistant Professor, Associate Professor, or Professor. Those faculty members who are an Instructor or Senior

Instructor typically are more focused on teaching while those at the Assistant Professor rank or higher are often teaching and research focused. A recommendation for future research is to investigate various universities of different environments, those universities who focus more on teaching, those more on research, and include community and technical colleges. In addition make a comparison to determine if any patterns of use within various LMS tools differ because of faculty rank and tenure status.

Third, it is important to investigate various LMS migrations other than Blackboard Vista to Desire2Learn. Given that in today's market, there are many LMS for universities to select, Blackboard, Desire2Learn, Canvas, Moodle, LearningStudio, and at least a dozen more, the results of this study may differ depending on the LMS selected. It would be interesting to conduct this study in other LMS migrations, especially open-source (e.g. Moodle) and how they compare to proprietary LMS (Canvas, LearningStudio, etc.) to determine if faculty members have the same results found in this study.

A fourth and final recommendation for future research is to investigate LMS migrations in different parts of the United States and the world. This study was conducted in a southern state within the United States. Further research is needed to determine if the results of these faculty members in this study are similarly compare to those faculty members in different parts of the United States or the world.

Recommendations for Practitioners

As a result of this study, a number of recommendations can be offered to future practitioners, which include college administrators, faculty, and e-learning staff, as a result of this study. First, college administrators must agree with Eynon (2008) and see

an LMS as "an integral part of teaching and learning in higher education" (p. 16). College administrators at one university in the state of South Carolina are supporting faculty members with integrating an LMS into classroom instruction through various internal competitive grant programs. These grants are designed to help faculty members convert a traditional face-to-face course into an online format or convert a series of lectures into a flipped-classroom approach. Regardless of which grant a faculty member receives, s/he is required to use the LMS and its tools and attend at least two training sessions/workshops during that academic year. In addition, college administrators need to approve and support the hiring of additional instructional designers and support staff. Providing one-on-one dedicated assistance to faculty members helps to ensure proper course design and pedagogy is being integrated. Ultimately, college administrators have to support the LMS and the hiring of additional support staff and, when possible, provide faculty incentives (e.g., grant programs, course release time, etc.) for adopting these systems.

Second, faculty members must be willing to spend time and learn how to use the LMS and its tools. While faculty members have busy schedules with teaching and conducting research, in order to remain effective in the classroom they must learn the LMS and additional instructional technologies. Frequently faculty members have to provide a minimum level of technical assistance to students (e.g., how to post to the discussion board). Attending these training sessions/workshops provides faculty with handouts to give to students on learning how to use the LMS tools and/or where students can go to receive technical assistance. In addition, faculty members must be willing to

experiment and try new LMS tools and technologies inside their classroom. Often trying new technologies could improve their patterns in teaching.

Third, and finally, e-learning staff must provide the necessary training and support to faculty members. As noted in the results of previous research studies and in this study, faculty members indicated that workshops/training sessions must be provided at various times and days of the week. One suggestion is to train faculty members during department meetings or meetings in which a large number of faculty members will be present. In addition, managers and directors must seek the approval of college administrators to hire additional support staff. Provided that universities/colleges are offering more online/hybrid courses, additional instructional designers are critical in order to ensure that faculty members understand how to use the various tools within an LMS also ensure that the tools are being integrated in the best pedagogical approach.

Summary

The goal of this study was to determine if faculty members' patterns in teaching using various tools within a learning management system (LMS) changed as a result of a major LMS migration. This study also investigated the challenges faculty members faced and the level of support and training used throughout the migration. This study used a survey approach by using the technology acceptance model (TAM) and levels of use of the innovation (LoU) as the guiding frameworks. Faculty members, both full-time and part-time/adjunct, at two universities within Georgia participated in the study. Results indicated that overall faculty members adopted most of the new LMS tools (Desire2Learn) at a higher rate compared to the old LMS (Blackboard Vista). In addition, results indicated that the overall system usage experience is not determined by the

number of years a faculty member has at teaching online or hybrid courses or by the gender of the faculty member. Lastly, results indicated that the overall training level is not determined by a faculty member's number of years having used an LMS outside of Blackboard Vista or Desire2Learn.

REFERENCES

Aggarwal, A., & Bento, R. (2002). Web-Based learning and technologies: Opportunities and challenges. In A. Aggarwal (Ed.), *Web-Based Education* (pp. 2-16). Hershey, PA: Idea Group Publishing.

Al-Busaidi, K. (2009). The impact of learning management system characteristics and user characteristics on the acceptance of e-learning. *International Journal of Global Management Studies*, *1*(2), 75-91.

Allen, E. & Seaman, J. (2013). *Changing Course: Ten Years of Tracking Online Education in the United States*. Babson Survey Research Group. Retrieved from http://www.educause.edu.

Allen, M., Titsworth, S., & Hunt, S. K. (2009). *Quantitative Research in Communication.* Thousand Oaks, CA: SAGE Publications, Inc. doi: http://dx.doi.org/10.4135/9781452274881.

Arispe, K., & Blake, R. J. (2012). Individual factors and successful learning in a hybrid course s*ystem: An International Journal of Educational Technology and Applied Linguistics*, *40*(4), 449-465.

Armstrong, D. (2011). Students' perceptions of online learning and instructional tools: A qualitative study of undergraduate students use of online tools. *Turkish Online Journal of Educational Technology , 10*(3), 222-226.

Avgeriou, P., Papasalouros, A., Retalis, S., & Skordalakis, M. (2003). Towards a pattern language for learning management systems. *Journal of Educational Technology & Society*, *6*(2), 11-24.

Baran, E., Correia, A. P., & Thompson, A. (2011). Transforming online teaching practice: A critical analysis of the online teaching literature. *Distance Education, 32*(3), 421-439.

Bennett, S., & Lockyer, L. (2004). Becoming an online teacher: Adapting to a changed environment for teaching and learning in higher education. *Educational Media International , 41*(3), 231-248.

Benson, R., & Palaskas, T. (2006). Introducing a new learning management system: An institutional case study. *Australasian Journal of Educational Technology*, *22*(4), 548-567.

Black, E., Beck, D., Dawson, K., Jinks, S., & DiPietro, M. (2007). The other side of the LMS: Considering implementation and use in the adoption of an LMS in online and blended learning environments. *TechTrends, 51*(2), 35-39.

Bonnel, W., & Boehm, H. (2011). Improving feedback to students online: Teaching tips from experienced faculty. *The Journal of Continuing Education in Nursing, 42*(11), 503-509.

Braak, J.V. (2001). Individual characteristics influencing teachers' class use of computers. *Journal of Educational Computing Research, 25*(2), 141-157.

Brown, S. A., Dennis, A. R., & Venkatesh, V. (2010). Predicting collaboration technology use: Integrating technology adoption and collaboration research. *Journal of Management Information Systems*, *27*(2), 9-53.

Burton, L. J., & Mazerolie, S. M. (2011). Survey instrument validity part I: Principles of survey instrument development and validation in athletic training education research. *Athletic Training Education Journal, 6*(1), 26-29.

Check, J., & Schutt, R. (2012). *Research Methods in Education*. Thousand Oaks, CA: SAGE Publications, Inc.

Chuttur, M. Y. (2009). Overview of the technology acceptance model: Origins, developments and future directions. *Sprouts: Working Papers on Information Systems*, *9*(37), 1-23. Retrieved from http://sprouts.aisnet.org/9-37.

Coldeway, D. (1995). Distance Education Revisited: An Introduction to the Issue. In Simonson, M., S. Smaldino & S. Zvacek (Eds.), *Teaching and Learning at a Distance* (pp. 7). New Jersey, NJ: Prentice-Hall, Inc.

Creswell, J. (2009). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (3rd ed.). Thousand Oaks, CA: SAGE Publications, Inc.

Creswell, J. W., & Clark, V. L. (2011). *Designing and Conducting Mixed Methods Research* (2nd ed.). Thousand Oaks, CA: SAGE Publications, Inc.

Daugherty, M., & Funke, B. L. (1998). University faculty and student perceptions of web-based instruction. *Journal of Distance Education*, *13*(1), 21-39.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use and user acceptance of information technology. *MIS Quarterly*, *13*(3), 319–340.

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science, 55*(8), 982-1003.

Elwood, S., Changchit, C., & Cutshall, R. (2006). Investigating students' perceptions on laptop initiative in higher education. an extension of the technology acceptance model. *Campus-Wide Information Systems, 23*(5), 336-349. doi:http://dx.doi.org/10.1108/10650740610714099.

Engel, R. J., & Schutt, R. K. (2010). *Fundamentals of Social Work Research*. Thousand Oaks, CA: Sage Publications Inc.

Field, A. (2009). *Discovering Statistics Using SPSS* (3rd ed.). Thousand Oaks, CA: Sage Publications Inc.

Fowler, F. (2009). Reasons for Surveys. In L. Bickman and D.J. Rog (Eds.), *Survey Research Methods* (pp. 1-10). Thousand Oaks, CA: Sage Publications.

Gautreau, C. (2011). Motivational factors affecting the integration of a learning management system by faculty. *Journal of Educators Online*, *8*(1), 1-25. Retrieved from http://files.eric.ed.gov/fulltext/EJ917870.pdf.

Ge, X., Lubin, I., & Zhang, K. (2010). An investigation of faculty's perceptions and experiences when transitioning to a new learning management system. *Knowledge Management & E - Learning: An International Journal, 2*(4), 433-447.

Georgouli, K., Skalkidis, I., & Guerreiro, P. (2008). A framework for adopting LMS to introduce e-learning in a traditional course. *Educational Technology & Society*, *11*(2), 227-240.

Goodyear, P., Salmon, G., Spector, J., Steeples, C., & Tickner, S. (2001). Competences for online teaching. *Educational Technology Research & Development, 40*(3), 65-72.

Graham, M. (2010). *What is inter-rater agreement and how can designers of teacher evaluation systems maximize it?* Center for Educator Compensation Reform. Retrieved from http://www.cecr.ed.gov/researchSyntheses/34008_CECR_RS_Inter_Rater_measurement_508.pdf

Gülbahar, Y., & Madran, R. O. (2009). Communication and collaboration, satisfaction, equity, and autonomy in blended learning environments: A case from turkey. *International Review of Research in Open and Distance Learning, 10*(2), 1-22. Retrieved from http://files.eric.ed.gov/fulltext/EJ844026.pdf.

Hall, B. (2000). *Learning Management Systems 2001: How to Choose the Right System for your Organization.* Brandon Hall Group. Retrieved from: http://www.brandonhall.com/learcomansy.html.

Hall, G., Loucks, S., Rutherford, W., & Newlove, B. (1975). Levels of use of the innovation: A framework for analyzing innovation adoption. *Journal of Teacher Education, 26*(1), 52-56.

Harper, K. C., Kuanchin, C., & Yen, D. C (2004). Distance learning, virtual classrooms, and teaching pedagogy in the internet environment. *Teaching in Society, 26*(1), 585-598.

Hashim, M. O. A. (2011). *Factors affecting the adoption of web-based learning management system by students in higher education: The case of jordan* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses databases. (3454220).

Keele, R. (2010). *Nursing Research and Evidence-based Practice* (1st ed.). Sudbury, MA: Jones & Bartlett Learning.

Kelley, D. L. (1999). *Measurement Made Accessible: A Research Approach using Qualitative, Quantitative, and Quality Improvement Methods*. Thousand Oaks, CA: Sage Publications Inc.

Kim, K. J., & Bonk, C. J. (2006). The future of online teaching and learning in higher education: The survey says. *EDUCAUSE Quarterly*, *29*(4), 22-30.

Leslie, S. (2003). *Important characteristics of course management systems: Findings from the Edutools.info project*. EdTech Post Educational Portal. Retrieved from http://www.edtechpost.ca/gems/cms_characteristics.htm.

Little-Wiles, J., & Naimi, L. L. (2011). Faculty perceptions of and experiences in using the blackboard learning management system. *Conflict Resolution & Negotiation Journal*, *4*(1), 1-13.

Lonn, S., & Teasley, S. D. (2009). Saving time or innovating practice: Investigating perceptions and uses of learning management systems. *Computers & Education, 53*(3), 686-694.

Martyn, M. (2003). The hybrid online model: Good practice. *Educause Quarterly*, *26*(1), 18-23.

McGill, T. J., & Klobas, J. E. (2009). A task–technology fit view of learning management system impact. *Computers & Education*, *52*(1), 496-508.

McIntyre, L. J. (1999). *The Practical Skeptic: Core Concepts in Sociology*. Mountain View, CA: Mayfield Pub. Co.

Medlin, B. D. (2001). *The factors that may influence a faculty member's decision to adopt electronic technologies in instruction* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses databases. (3095210).

Meloni, J. (2010). *Technologies for teaching online: Strategies and pitfalls.* The Chronicle of Higher Education. Retrieved from http://chronicle.com.pallas2.tcl.sc.edu/article/Technologies-for-Teaching/125109.

Moore, M. G. & Kearsley, G. (1996). *Distance Education: A System View*. Belmont, CA: Wadsworth.

Mullinix, B. B., & McCurry, D. (2003). *Balancing the learning equation: Exploring effective mixtures of technology, teaching, and learning*. Retrieved from http://technologysource.org/article/balancing_the_learning_equation.

Navak, M. K., & Suesaowaluk, P. (2007). *Advantages and disadvantages of elearning management system*. Paper presented at the Fourth International Conference on eLearning for Knowledge-Based Society, Bangkok, Thailand. Abstract retrieved from http://www.elearningap.com/eLAP2007/Proceedings/P22eLearningAP_AdvantagesAndDisadvantages.pdf.

Parenti, M. (2011). *Student perceptions of the relationship between web-based instructional tools and perceived attainment of intended learning outcomes.* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses databases. (3513825).

Paste, V., & Ionita, M. (2013). Advantages and Disadvantages of using educational platforms in the process of acquiring forgein langauages. *Elearning & Software Education,* 465-469.

Patton, M. (2002). *Qualitative Research and Evaluation Methods* (3rd ed.). Thousand Island, CA: Sage Publications Inc.

Petrovic, T., & Kennedy, G. (2005). How often do students use a learning management system in an on-campus, problem-based learning curriculum? In *Proceedings of the Annual Conference of the Australasian Society for Computers in Learning in Tertiary Education, (p.* 535-538).

Pinsonneault, A., & Kraemer, K. L. (1993). *Survey research methodology in management information systems: An assessment.* UC Irvine: Center for Research on Information Technology and Organizations. Retrieved from: http://escholarship.org/uc/item/6cs4s5f0.

Pituch, K. A., & Lee, Y. K. (2006). The influence of system characteristics on e-learning use. *Computers & Education, 47*(2), 222–244.

Polit, D., & Hungler, B. (1991). *Nursing Research: Principles and Methods.* New York: JB Lippincott.

Rea, L. M., & Parker, R. A. (2005). *Designing and Conducting Survey Research: A Comprehensive Guide* (3rd ed.). San Francisco, CA: Jossey-Bass, Inc.

Redmond, P. (2011, December). *From face-to-face teaching to online teaching: Pedagogical transitions*. Conference Proceeding Ascilite 2011. Retrieved from http://www.ascilite.org.au/conferences/hobart11/downloads/papers/Redmond-full.pdf.

Reiser, R. A., & Dempsey, J. V. (2007). *Trends and Issues in Instructional Design* (2nd ed.). Upper Saddle River, NJ: Pearson Education, Inc.

Rogers, E. M. (2003). *Diffusion of Innovations* (5th ed.). New York, NY: Free Press.

Roqueta, M. (2008). Learning management systems: A focus on the learner. *Distance Learning*, *5*(4), 59-66.

Ryan, T., Toye, M., Charron, K., & Park, G. (2012). Learning management system migration: An analysis of stakeholder perspectives. *International Review of Research in Open & Distance Learning, 13*(1), 220-237.

Saadé, R., & Bahli, B. (2005). The impact of cognitive absorption on perceived usefulness and perceived ease of use in on-line learning: an extension of technology acceptance model. *Information & Management, 42*(2), 317-327.

Schutt, R. (2011). Chapter 5 Sampling. In *Investigating the Social World: The Process and Practice of Research* (ed.,). Thousand Oaks, CA: SAGE Publications.

Seaman, J. (2009). Online learning as a strategic asset. Volume II: The paradox of faculty voices-views and experiences with online learning. Results of a National Faculty Survey, Part of the Online Education Benchmarking Study Conducted by the APLU-Sloan National Commission on Online Learning.

Secolsky, C. (1987). On the direct measurement of face validity: A comment on nevo. *Journal of Educational Measurement*, *24*(1), 82-83.

Seels, B. B., & Richey, R. C. (1994). *Instructional technology: The definition and domains of the field*. Washington, DC: Association for Educational Communications and Technology.

Sahin, I. (2008). From the social-cognitive career theory perspective: A college of education faculty model for explaining their intention to use educational technology. *Journal of Educational Computing Research, 38*(1), 51-66.

Skylar, A. A. (2004). *Distance education: An exploration of alternative methods and types of instructional media in teacher education* (Doctoral dissertation). Available from ProQuest Dissertations and Theses databases. (UMI no. 3144530).

Spelke. (2011). *Factors affecting selection of learning management systems in higher education institutions.* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses databases. (3503700).

Tallent-Runnels, M. K., Lan, W. Y., Cooper, S., Ahern, T. C., Shaw, S. M., & Liu, X. (2006). Teaching courses online: A review of the research. *Review of Educational Research*, *76*(1), 93-135. Retrieved from http://www.jstor.org/stable/3700584.

Telg, R.W. (1999). *Instructional methods for distance education* (AEC 345). Gainesville: University of Florida Institute of Food and Agricultural Sciences. Retrieved from: http://edis.ifas.ufl.edu/wc026.

Venkatesh, V. (2000). Determinants of perceived ease of use: Integrating control, intrinsic motivation, and emotion into the technology acceptance model. *Information Systems Research, 11*(4), 342-365.

Venkatesh, V., & Davis, F. D. (1996). A model of the antecedents of perceived ease of use: Development and test. *Decision Sciences, 27*(3), 451-481.

Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science, 46*(2), 186-204.

Venkatesh, V., Morris, M. G., Davis, F. D., & Davis, G. B. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly, 27*(1), 425-478.

Venkatesh, V., Thong, J., & Xu, X. (2012). Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology. *MIS Quarterly*, *36*(1), 157-178.

Watson, W. R., Lee, S., & Reigeluth, C. M. (2007). Learning management systems: An overview and roadmap of the systematic application of computers in education. In F. Neto , & F. Brasileiro (Eds.), *Advances in Computer-Supported Learning* (pp. 66-96). Hershey, PA: Information Science Publishing. doi:10.4018/978-1-59904-355-5.ch004.

Watson, W. R., & Watson, S. L. (2007). An argument for clarity: What are learning management systems, what are they not, and what should they become? *TechTrends*, *51*(2), 28-34.

White, B., & Larusson, J. (2010). Seeing, thinking, doing: Strategic directives for learning management systems. In J. Sanchez & K. Zhang (Eds.), *Proceedings of World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education 2010* (pp. 1279-1288). Chesapeake, VA: AACE. Retrieved from http://www.editlib.org/p/35731.

Wilson, G., & Stacey, E. (2004). Online interaction impacts on learning: Teaching the teachers to teach online. *Australasian Journal of Educational Technology, 20*(1), 33-48.

Wingard, R. G. (2004). Classroom teaching changes in web-enhanced courses: A multi-institutional study. *EDUCAUSE Quarterly*, *27*(1), 26-35.

Woods, R., Baker, J. D., & Hopper, D. (2004). Hybrid structures: Faculty use and perception of web-based courseware as a supplement to face-to-face instruction. *Internet and Higher Education*, *7*(4), 281–297.

Yang, Y., & Cornelious, L. (2005). Preparing instructors for quality online instruction. *Online Journal of Distance Learning Administration, 8*(1). Retrieved from http://www.educause.edu/library/resources/preparing-instructors-quality-online-instruction.

Yates, B. L. (2008, May). *Apply diffusion theory: Adoption of media literacy programs in schools*. Paper presented at to the Instructional and Developmental Communication Division International Communication Association Conference. Abstract retrieved from http://www.westga.edu/~byates/applying.htm.

Appendix A:

Letter of Interest to Georgia Universities and Colleges

VALDOSTA STATE UNIVERSITY
Building for Our Next Century

Dear E-Learning Administrators,

A study is being conducted in the College of Education at Valdosta State University to assess the extent to which faculty members have changed their online teaching practices (e.g., use of tools such as gradebook, discussions, announcements, etc.) as a result of the migration from Blackboard Vista to Desire2Learn. In addition, the study explores what obstacles were encountered during the migration and the levels of support and training faculty members used during the transition from one platform to another. The results of this study are intended to aid e-Learning professional in delivering the necessary support and training to faculty to promote the delivery of effective online instruction.

As faculty and e-learning professionals engaged in improving online learning, we continuously are seeking new methods and information to identify and assess the practices employed by faculty in delivering online instruction. With your help, this study will incorporate data and findings from multiple universities in Georgia, thereby enabling you and other e-learning administrators to identify strengths and opportunities within your institution and the state. To accomplish this research, an online survey will be administrated during March and April to full-time and adjunct faculty members in universities around the state. The survey population includes only those faculty members who have taught online or hybrid courses in both Desire2Learn and Blackboard Vista platforms. For the purpose of this study, "hybrid courses" are defined as those courses where the majority of instruction is delivered online within the LMS. The survey takes approximately 20 minutes to complete and all data is reported in aggregate form.

By participating in this research, administrators and faculty at your institution will gain valuable insights into online teaching practices at your institution and within the state of Georgia. To find out how your institution can participate, contact the study's principal investigator, Ryan Rucker (contact information is provided below) or Dr. Steve Downey, VSU College of Education.

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Appendix B:

Selected Quotes from Open-Ended Questions

Question 1

For the first theme, no change on the use of tools for teaching, some notable comments from faculty members were:

- Faculty member #158: "No but these tools are not as user-friendly as those of the prior LMS."
- Faculty member #175: "No I have not really changed the tools I use when teaching."
- Faculty member #178: "No, not really as it takes me longer to build assessments."
- Faculty member #215: "Not really. They accomplish the same tasks that I need them to in order for my course to function effectively."
- Faculty member #66: "I stopped using Desire2Learn because it was quirky and there was little to no ease of using it anymore."

For the second theme, slight change on the use of tools for teaching, some notable comments from faculty members were:

- Faculty member #49: "I have not made much changes in teaching due to the migration. The tools that I used from Blackboard Vista, I use the similar tools on Desire2Learn. However, I make use of the 'News' with automated email notification option frequently."
- Faculty member #58: "I have not changed my own use of tools that much, but I appreciate that the Desire2Learn grade book is much more robust and able to subdivide percentages for multiple items within a category automatically."
- Faculty member #68: "I tend to rely on the grade book in the new system more than in the past."

- Faculty member #63: “I set up learning modules more now because Desire2Learn is easier to use.”

For the third theme, significant change on the use of tools for teaching, some notable comments from faculty members were:

- Faculty member #45: “ I have integrated more online technology while using Desire2Learn.”
- Faculty member #221: “Prior to D2L, I used the LMS sparingly (mostly grade book applications and some announcements). In the past year, I have had to learn more about the LMS (specifically D2L) since I have started teaching online courses. Since acquiring more knowledge about the LMS, I have begun using it more extensively in my traditional classes as well (for example, posting recorded lectures to free up class time to have groups work on projects - flipping the classroom)”.
- Faculty member #252: “Yes I use it much more often and for many different things. All my assessments are on D2L and much of the class work is put in a drop box. I need to learn more.”
- Faculty member #262: “Yes. I am trying to follow the Quality Matters criteria for online courses, even though I teach mostly face-to-face. D2L is a great organizing tool, generally.”
- Faculty member #251: “Yes, I like the discussion board on Desire2Learn, and the modules have worked well. I particularly like course builder tool. The platform has seemed reliable, and I am glad it is access friendly.”

Question 2

For the first theme, no issues experiencing during the migration process, some noteworthy comments from faculty members were:

- Faculty member #30: “Faced no issues.”
- Faculty member #57: “I do not recall any particular issues.”
- Faculty member #96: “I thought the migration was fine. I like Desire2Learn.”
- Faculty member #111: “It was a good experience for me.”
- Faculty member #119: “Migration was easy and no anxiety was involved.”
- Faculty member #121: Migration went fairly smoothly.”

For the second theme, minor complications, some significant comments from faculty members were:

- Faculty member #4: “Any migration process takes adjustment. Both systems have some virtues. I like the module tool in Desire2Learn.”
- Faculty member #107: “Initially, I found Desire2Learn exceedingly more difficult than Blackboard Vista.”
- Faculty member #52: “I did not have too many problems except with format.”
- Faculty member #122: “Migration, for the most part, went smoothly. Had to tweak some content areas, but expected to do so. Experienced a bit of a learning curve to use Desire2Learn tools.”

For the third theme in this set of open-ended questions, serious complications, some important comments from faculty members were:

- Faculty member #18: “Desire2Learn has WAY, WAY more features than most us really need and that becomes its own hindrance.”

- Faculty member #7: "At the time the key staff person in charge of the transition was condescending. Our current staff is superior and supportive."
- Faculty member # 17: "Desire2Learn has crushed my desire to learn!"
- Faculty member # 37: "I am frustrated how many of my courses will be ending up in the 'dustbin' because I teach on a 5-year rotation."
- Faculty member #67: "I have found that Desire2Learn has useful features that USG institutions do not have access to. We were told that Desire2Learn would come with analytic features that we have not see so far."

Question 3

For the first theme, calling the I.T./Desire2Learn phone support, some noteworthy comments from faculty members were:

- Faculty member #12: "Called help desk for assistance".
- Faculty member # 7: "Asking help from eLearning group directly. I need human interface and colleges."
- Faculty member #82: "Initially I called the 24/7 Desire2Learn hotline quite a few times.

For the second theme, trial and error, some noteworthy comments from faculty members were:

- Faculty member #143: "Trial and error."
- Faculty member #170: "Trial and error. A sandbox was created for us and sometimes I would try something in the sandbox course to see if I could get it to work before I would try it in my own course."
- Faculty member #111: "Practice and trial and error."

For the third theme, attending training sessions, some noteworthy comments from faculty members were:

- Faculty member #131: “Took multiple training workshops sponsored by the I.T. department.”
- Faculty member #135: “The required training session was essential.”
- Faculty member #137: “The training I received through eCore was excellent and I did not have any difficulties at all.

For the fourth theme, asking a co-worker, some noteworthy comments from faculty members were:

- Faculty member #2: “Worked with colleagues.”
- Faculty member #113: “Primarily use staff assistance and copying from another faculty member.”
- Faculty member #72: “I rarely have problems. If I do, I ask coworkers.”

For the fifth theme, self taught, some noteworthy comments from faculty members were:

- Faculty member #120: “Self experimentation to learn how to set up and navigate.”
- Faculty member #123: “Self exploration of Desire2Learn.”
- Faculty member # “133: “Taught myself.”

For the sixth theme, other methods, some noteworthy comments from faculty members were:

- Faculty member #30: “Googled other universities’ tutorials for specific tasks. Most of the instructions provided by the system or the university were designed

from the perspective of technicians, rather than from the perspective of faculty who teaches courses."

- Faculty member #36: "I asked my son for help. He is college aged and was essential."
- Faculty member #70: "I quit using it- I no longer use anything the cheap program was designed to replace. I cannot use the testing/assessment anymore-I do not trust it.

Question 4

A few faculty members indicated that none of the tools within Desire2Learn were beneficial. Some prominent quote included:

- Faculty member #186: "None, I find it (Desire2Learn) to be worse."
- Faculty member #190: "None. The two systems deliver readings to my students equally well."
- Faculty member #192: "Not aware of any enhancements that are useful."

Question 5

For the first theme, more time to learn the system, a few momentous quotes from faculty members included:

- Faculty member #112: "More time to learn the system well before teaching."
- Faculty member #113: "More time to transition."
- Faculty member #48: "Give much more lead time so we can prep for the crossover."

- Faculty member #88: “It would be nice to allow faculty who use the LMS to see the new system in advance of the school year.”

The second theme, more training and instruction, some of the most notable quotes included:

- Faculty member #89: “It would be nice to get training.”
- Faculty member #128: “Offer training session on a variety of days so that more faculty can attend.”
- Faculty member #107: “More instructions.”
- Faculty member #144: “Simple, clear instructions with one-to-one matchups showing the old and new paralleled.”

The third theme, reconsider other LMS, some of the most valuable quotes included:

- Faculty members #39, 50, and 51: “Go back to Blackboard.”
- Faculty member #94: “Look into Moodle, if not that, go with Blackboard.”
- Faculty member #104: “Migrate to Canvas.”
- Faculty member #133: “Pick most user friendly platform.”

The fourth theme, no comments or improvement necessary, some of the most meaningful quotes included:

- Faculty member #62: “I do not have any recommendations so far:”
- Faculty member #122: “No changes are really required. Keep inviting faculty and keep making participation easy.”
- Faculty member #84: “I am fine, just do not make it worse.”
- Faculty member #76: “I thought it went well—so none.”

Appendix C:

First Email to Faculty

Dear ___,

____(university name) is participating in a study examining if and how faculty members have altered their online teaching practices as a result of the campus's migration from Blackboard Vista to Desire2Learn. To better understand this transition, your input is needed.

This study utilizes a brief online questionnaire to gather your input. The survey will only take about 20 minutes to complete. The survey is housed on a secure website; your responses will be collected without identifying who you are; and results will be reported in aggregate. The knowledge gained from this research is intended to better support faculty who teach using online content systems such as Blackboard Vista or Desire2Learn.

As a small token of appreciation for participating, individuals completing the survey will be registered for one of two $50 gift certificates to a local restaurant. The URL for this survey is:

https://valdosta.co1.qualtrics.com/SE/?SID=SV_8G3Ma3AWDQs9HrT

If you have any questions about this study, you can contact the person(s) below:

Mr. Ryan Rucker
Doctorate Candidate
906 Karlaney Avenue
Cayce, SC 29033
E-mail: rdrucker@valdosta.edu
Phone: 803-777-9948

-or-

Dr. Steve Downey
Associate Professor
Valdosta State University
CAC, Room 216
Email: sedowney@valdosta.edu
Phone: 229-333-5633

This study has been reviewed and approved by Valdosta State University's Institutional Review Board (IRB). The IRB has determined that this study meets the ethical obligations required by federal law and University policies. If you have questions or concerns regarding this study, please contact the Office of Sponsored Programs and Research Administration at 229-259-5045.

I hope that you will be able to participate in this study.

Sincerely,

Ryan Rucker

Appendix D:

Second Email to Faculty

Dear ____,

____(university name) is participating in a study examining if and how faculty members have altered their online teaching practices as a result of the campus's migration from Blackboard Vista to Desire2Learn. To better understand this transition, your input is needed.

On October 6 an email was sent to you asking for your participation in this study. Your input is vital to this research and will not take long to submit, but it would be very appreciated if you could spend a few moments to participate in the survey. Note that if you did not use Blackboard Vista you may still complete the survey. When asked to select the answer that best matches how often you used the tool within Blackboard, select Non-Use (Little to knowledge of tool).

This study utilizes a brief online questionnaire to gather your input. The survey will only take about 20 minutes to complete. The survey is housed on a secure website; your responses will be collected without identifying who you are; and results will be reported in aggregate. The knowledge gained from this research is intended to better support faculty who teach using online content systems such as Blackboard Vista or Desire2Learn.

As a small token of appreciation for participating, individuals completing the survey will be registered for one of two $50 gift certificates to a local restaurant. The URL for this survey is:

https://proxy.qualtrics.com/proxy/?url=https://valdosta.co1.qualtrics.com/SE/?SID=SV_8G3Ma3AWDQs9HrT

If you have any questions about this study, you can contact the person(s) below:

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Dr. Steve Downey
Associate Professor
Valdosta State University
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Email: sedowney@valdosta.edu

Phone: 229-333-5633

This study has been reviewed and approved by Valdosta State University's Institutional Review Board (IRB). The IRB has determined that this study meets the ethical obligations required by federal law and University policies. If you have questions or concerns regarding this study, please contact the Office of Sponsored Programs and Research Administration at 229-259-5045.

I hope that you will be able to participate in this study.

Sincerely,

Ryan Rucker

Appendix E:

Third Email to Faculty

Dear ___,

____(university name) is participating in a study examining if and how faculty members have altered their online teaching practices as a result of the campus's migration from Blackboard Vista to Desire2Learn. The knowledge gained from this research is intended to better support faculty like yourself who teach using online content systems.

To better understand this transition, your input is needed. On October 6 and 20 an email was sent to you asking for participation in this study. According to the system's records, you have not completed the online survey. The survey takes less than 20 minutes to complete and is housed on a secure website. Your responses will be collected without identifying who you are and results will be reported in aggregate.

If you would spend a few moments to complete the survey, your knowledge and experiences will help us in identifying the challenges, needs, and support requirements for faculty trying to teach online. Note: if you did not use Blackboard Vista, you may still complete the survey. When asked to select the answer that best matches how often you used the tool within Blackboard, select Non-Use (Little to knowledge of tool).

As a small token of appreciation for participating, individuals completing the survey will be registered for one of two $50 gift certificates to a local restaurant. The survey will close on November 21, 2014.

The URL for this survey is:

https://proxy.qualtrics.com/proxy/?url=https://valdosta.co1.qualtrics.com/SE/?SID=SV_8G3Ma3AWDQs9HrT

If you have any questions about this study, you can contact the person(s) below:

Mr. Ryan Rucker
Doctorate Candidate
906 Karlaney Avenue
Cayce, SC 29033
E-mail: rdrucker@valdosta.edu
Phone: 803-777-9948

-or-

Dr. Steve Downey
Associate Professor
Valdosta State University
CAC, Room 216
Email: sedowney@valdosta.edu

Phone: 229-333-5633

This study has been reviewed and approved by Valdosta State University's Institutional Review Board (IRB). The IRB has determined that this study meets the ethical obligations required by federal law and University policies. If you have questions or concerns regarding this study, please contact the Office of Sponsored Programs and Research Administration at 229-259-5045.

I hope that you will be able to participate in this study.

Sincerely,

Ryan Rucker

Appendix F:

Fourth Email to Faculty

Dear ____,

Your final opportunity to be a part of ____(university name)'s research regarding the transition from Blackboard to Desire2Learn will be closing soon.

To ensure your voice is heard, please spend a few moments to complete the online survey; your knowledge and experiences will help us in identifying the challenges, needs, and support requirements for faculty trying to teach online. Note: if you did not use Blackboard Vista, you may still participate. When asked to select the answer that best matches how often you used the tool within Blackboard, select Non-Use (Little to knowledge of tool).

The knowledge gained from this research is intended to better support faculty like yourself who teach using online content systems. As a small token of appreciation for participating, individuals completing the survey will be registered for one of two $50 gift certificates to a local restaurant. The survey will close on December 12, 2014. So please act quickly.

The URL for this survey is:

https://valdosta.co1.qualtrics.com/WRQualtricsSurveyEngine/?Q_SS=ezXj8fM54Yk5UCp_8G3Ma3AWDQs9HrT&_=1

If you have any questions about this study, you can contact the person(s) below:

Mr. Ryan Rucker
Doctorate Candidate
906 Karlaney Avenue
Cayce, SC 29033
E-mail: rdrucker@valdosta.edu
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-or-

Dr. Steve Downey
Associate Professor
Valdosta State University
CAC, Room 216
Email: sedowney@valdosta.edu
Phone: 229-333-5633

This study has been reviewed and approved by Valdosta State University's Institutional Review Board (IRB). The IRB has determined that this study meets the ethical obligations required by federal law and University policies. If you have questions or

concerns regarding this study, please contact the Office of Sponsored Programs and Research Administration at 229-259-5045.

We hope you take advantage of this opportunity to advance the research in this area of teaching and learning.

Sincerely,

Ryan Rucker

Appendix G:

Survey Instrument

Page 1 of Survey Instrument

You are being asked to participate in a survey research project entitled "Exploring Faculty Use Before and After a Learning Management System Migration: A Survey Approach," which is being conducted by Ryan Rucker, a doctoral candidate at Valdosta State University. This survey is anonymous. No one, including the researcher, will be able to associate your responses with your identity. Your participation is voluntary. You may choose not to take the survey, to stop responding at any time, or to skip any questions that you do not want to answer. You must be at least 18 years of age to participate in this study. Your completion of the survey serves as your voluntary agreement to participate in this research project and your certification that you are 18 or older. The results of this study will be used for scholarly purposes as well as for aiding e-learning professionals in delivering the necessary support and training to faculty to promote the delivery of effective online instruction.

There are no foreseeable risks associated with this research and since participation is voluntary you can withdraw at any time. If you decide to quit before you have finished the questionnaire, your answers will NOT be retained. Conversely, completers of the questionnaire will be entered in a drawing for one of two $50.00 gift certificates to a local restaurant.

Questions regarding the purpose or procedures of the research should be directed to Ryan Rucker at 803-730-6714 or rdrucker@valdosta.edu. This study has been exempted from Institutional Review Board (IRB) review in accordance with Federal regulations. The IRB, a university committee established by Federal law, is responsible for protecting the rights and welfare of research participants. If you have concerns or questions about your rights as a research participant, you may contact the IRB Administrator at 229-259-5045 or irb@valdosta.edu.

>>

Section 1: Demographics

Select your gender:

- Male
- Female

Select the year of your birth date:

Select your faculty status:

- Full-time
- Adjunct

Which types of courses do you usually teach?

NOTE: A hybrid course is a course that has one or more face to face meetings to supplement its online content.

- All face-to-face
- Mostly face-to-face and a few online/hybrid
- Equal mixture of face-to-face and online/hybrid
- Mostly online/hybrid and a few face-to-face
- All online/hybrid

How many years of experience do you have teaching face-to-face courses at higher education institutions?

- ◯ Less than 1 year
- ◯ 1-5 years
- ◯ 6-10 years
- ◯ 11-15 years
- ◯ 16-20 years
- ◯ More than 20 years

How years of experience do you have actively teaching online or hybrid courses at higher education institutions??

NOTE: A hybrid course is a course that has one or more face to face meetings to supplement its online content.

- ◯ Less than 1 year
- ◯ 1-5 years
- ◯ 6-10 years
- ◯ 11-15 years
- ◯ 16-20 years
- ◯ More than 20 years

How many years of experience do you have at using Blackboard Vista?

- ◯ Less than 1 year
- ◯ 1-3 years
- ◯ 4-5 years
- ◯ More than 5 years

How many years of experience do you have at using an LMS other than Blackboard Vista and Desire2Learn?

- ◯ Less than 1 year
- ◯ 1-3 years
- ◯ 4-5 years
- ◯ More than 5 years

Section 2: LMS Tool's Level of Use

Select the answer that best matches how often you used the tool within the Blackboard Vista LMS (old LMS).

	Non-Use (Little to no knowledge of tool)	Orientation (Seeking information about tool)	Preparation (Developing a plan to start using the tool)	Mechanical (Use the tool rarely)	Routine (Use the tool frequently with no changes in class structure)	Integration (Always use tool and suggest tool to others)	Renewal (Seeking a more effective alternative to the tool)
Announcements	○	○	○	○	○	○	○
Assessments	○	○	○	○	○	○	○
Built-in email box	○	○	○	○	○	○	○
Discussion boards	○	○	○	○	○	○	○
Gradebook	○	○	○	○	○	○	○
Groups	○	○	○	○	○	○	○
Learning Modules	○	○	○	○	○	○	○
Wimba/Blackboard Collaborate	○	○	○	○	○	○	○
SCORM content	○	○	○	○	○	○	○
Selective Release	○	○	○	○	○	○	○

Select the answer that best matches how often you used the tool within the new Desire2Learn LMS.

	Non-Use (Little to no knowledge of tool)	Orientation (Seeking information about tool)	Preparation (Developing a plan to start using the tool)	Mechanical (Use the tool rarely)	Routine (Use the tool frequently with no changes in class structure)	Integration (Always use tool and suggest tool to others)	Renewal (Seeking a more effective alternative to the tool
Assessments	○	○	○	○	○	○	○
Built-in email box	○	○	○	○	○	○	○
Discussion boards	○	○	○	○	○	○	○
Gradebook	○	○	○	○	○	○	○
Groups	○	○	○	○	○	○	○
Learning Modules	○	○	○	○	○	○	○
Wimba/Blackboard Collaborate	○	○	○	○	○	○	○
News	○	○	○	○	○	○	○
SCORM content	○	○	○	○	○	○	○
Selective Release	○	○	○	○	○	○	○

After this migration to Desire2Learn, have you changed your use of tools for teaching? If so, how?

Section 3: Experience Using Desire2Learn

Select the answer that best matches the experiences you faced once using Desire2Learn (new LMS) compared to Blackboard Vista (old LMS).

	Strongly Disagree	Somewhat Disagree	Neither Agree or Disagree	Agree	Strongly Agree
How to prepare for the migration was not clearly defined.	○	○	○	○	○
Course content did not transfer correctly to Desire2Learn.	○	○	○	○	○
Desire2Learn works differently within various browsers.	○	○	○	○	○
Desire2Learn runs slower than Blackboard Vista.	○	○	○	○	○
Plugins often have to be installed to use Desire2Learn.	○	○	○	○	○
Desire2Learn is harder to navigate.	○	○	○	○	○
Desire2Learn's tools and options are harder to understand.	○	○	○	○	○
Desire2Learn is less stable and/or timeouts often.	○	○	○	○	○
Desire2Learn overall is a more complex system.	○	○	○	○	○

Please provide a list of additional experiences faced during the migration process from Blackboard Vista to Desire2Learn.

Section 4: Learning How to Use Desire2Learn

Select the answer that best matches how you learned to use the tools and navigation of Desire2Learn (new LMS).

	Never	Rarely	Sometimes	Often	Always
Watched an e-learning tutorial produced by the university/college.	○	○	○	○	○
Attended a training workshop held by the university/college.	○	○	○	○	○
Called technical support at the university/college.	○	○	○	○	○
Asked a co-worker for assistance at the university/college.	○	○	○	○	○
Used the Internet (outside of using any resource provided by the university/college).	○	○	○	○	○
Used another source outside of the 5 listed above.	○	○	○	○	○

What other types of strategies have you used to overcome the difficulties of using Desire2Learn?

Section 5: Open-End Questions

The following questions are required open-ended questions.

What tools or enhancements within Desire2Learn have you found to be the most beneficial when teaching online, hybrid, or traditional face-to-face courses?

What changes or recommendations should be made for future LMS migrations?

Additional Comments (optional):

Click the arrows pointing to the right to finish and submit your survey. Click on the arrows to the left to go back and review your responses.

Appendix H:

MANOVA Tables

Test of Equality of Covariance Matrices

Box's M	*F*	df_1	df_2	*p*
57.33	1.97	27	6039.30	.00*

* $p < .05$

Multivariate Test Results Using Pillai's Trace Criteria

Effect	Value	*F*	df_1	*Error df*	*p*
Faculty status	.03	3.36[b]	2	243	.04*
Types of courses	.30	10.55	8	488	.00*
Faculty status x types of courses	.02	.51	8	488	.85

* $p < .05$
b. Exact statistic

Levene's Test of Equality

Overall Rating	*F*	df_1	df_2	*p*
Blackboard	1.57	9	244	.12
Desire2Learn	1.55	9	244	.13

* $p < .05$

Post Hoc Test (Scheffe) for the "Types of courses"effect

Overall Rating	Types of Courses	Courses	Mean Difference	Std. Error	*p*
Blackboard	F2F	All hybrid	-.80	.20	.00*
		F2F/hybrid	-1.28	.26	.00*
		F2F/online	-1.50	.33	.00*
		Online/hybrid	-1.41	.28	.00*
Desire2Learn	F2F	All hybrid	-1.07	.16	.00*
		F2F/hybrid	-1.73	.21	.00*
		F2F/online	-1.50	.28	.00*
		Online/hybrid	-1.59	.23	.00*

* $p < .05$
*The mean difference is significant at the .05 level

Post Hoc Test (ANOVA) for the "Faculty status"effect

Overall Rating	Sum of Squares	Mean Square	*df*	*F*	*p*
Blackboard Between Groups	11.77	11.77	1	5.87	.02*
Desire2Learn Between Groups	12.21	12.21	1	7.47	.01*

* $p < .05$

ANOVA Descriptive

Overall Rating	Status	*N*	*M*
Blackboard	Full-time	195	2.98
	Adjunct	59	2.47
Desire2Learn	Full-time	195	3.51
	Adjunct	59	2.98